January 1951

2'- Monthly

BUSINESS

The Journal of Management in Industry



WHAT OF 1951?

Business Prospects in Festival Year (page 41)



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BUSINESS FOR JANUARY, 1951

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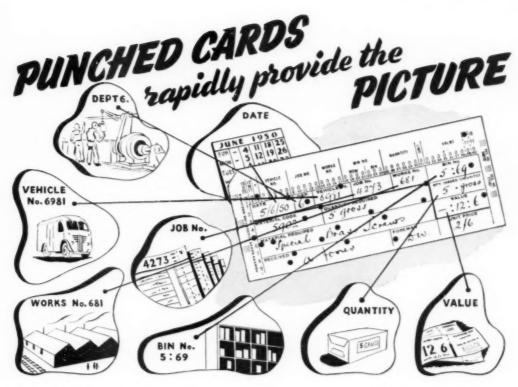
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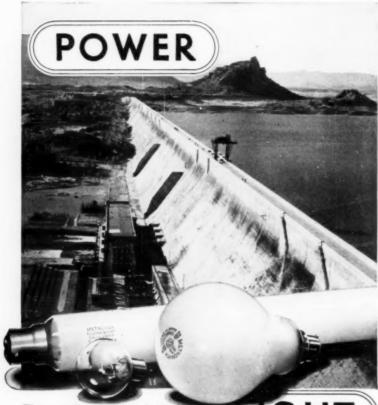


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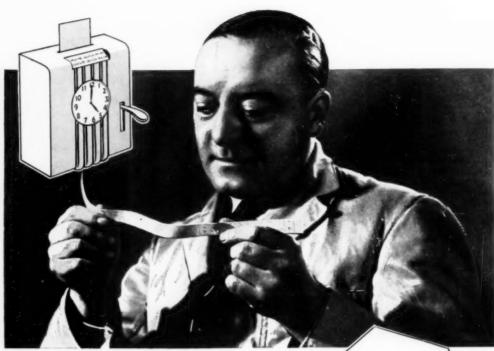


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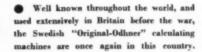
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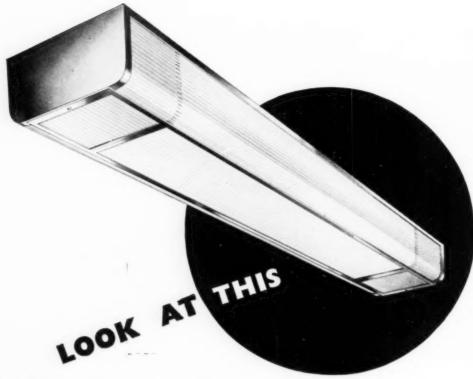
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The Journal of Management in Industry

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COVER PHOTOGRAPH: The cover photograph, specially taken by a BUSINESS photographer from the roof of Waterloo Station, shows buildings taking shape on the Festival of Britain site.

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The MARCH of BUSINESS

MEASURING PRODUCTIVITY

IF we want higher productivity, we must know first what our productivity is now, and second what it is after we have adopted the measures we think will improve it. In other words, we must continually measure efficiency.

This is not easy—efficiency is an elusive concept to turn into hard figures. But it can be done, and the report of the Anglo-U.S. Productivity Council on "Measurement of Productivity in British Industry" shows just how it is being done in five British firms.

Executives of Joseph Lucas Ltd., Courtaulds Ltd., the United Steel Co., Ltd., the British Boot, Shoe and Allied Trades Research Association and Thos. Taylor & Bro, Ltd., describe how elementary statistical techniques are used in their organizations to check productivity.

The report is a striking testimony to one of the many uses to which businessmen may put the new methods outlined in an article on page 49 and to the extent to which modern management is based on figures.

THE B.I.M. AT HARROGATE

A THREE-DAY conference ranging over the whole field of management must of necessity cover a great deal of ground. The autumn conference of the British Institute of Management at Harrogate in November was no exception, and a summary of its proceedings can be little more than a brief resumé of speeches made, papers read, and discussions held.

In the event, the proceedings did crystallize out into three recognizable themes. The first was the whole question of human relations in industry, covered by papers and debates ranging from the appointment of directors to joint consultation on the shop floor. The second was the question of manufacturing costs and how to reduce them. The third was a miscellany of specialist subjects, from packaging to the centralization or decentralization of office services.

HUMAN FACTORS IN INDUSTRY

HE dominant theme of human relations in industry was set in the opening address by the Rt. Hon. R. A. Butler, P.C., M.P., a director of Courtaulds, but more familiar to delegates from his association with the "Industrial Charter" of the Conservative Party. In a somewhat discursive paper on "Managers of the Future," Mr. Butler made three main points. First, the responsibility of managers is steadily increasing, partly due to the disappearance of the old type of family concern through heavy taxation, partly to the increase in size of the business unit, and partly due to the disappearance of share-holders' control of public companies with the splitting up of individual holdings. This last point was dealt with in greater detail in a paper by Mr. G. S. A. Wheatcroft, a partner in Messrs, Corbin, Greener & Cook, who suggested the

appointment of trustees to undertake the appointment of directors to fill vacancies occurring between annual general meetings. This proposal did not command much support from the meeting.

SPECIALISTS ON TAP

THE second point that Mr. Butler made was that, with the emergence of the specialist in various branches of management—the production engineer, the cost accountant, the time study engineer and so on—much of the functional work previously undertaken by the manager was being hived off, so that he had more time and greater scope for his true role—man management.

This point was also stressed on the following day by Sir Robert Sincair, president of the Federation of British Industries, who summed up his position by quoting the epigram that the specialist should be on tap but not on top The specialist was part of management, but was not management itself. There was no reason why the specialist should not become



The Rt. Hon, R. A. Butler opens the B.I.M. Conference under the watchful eye of Sir Harold West (left), managing director, Newton Chambers & Co., Ltd. Sir Charles Renold (right), chairman B.I.M. is thoughtful.

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SPECIALISTS IN SCIENTIFIC SEATING FOR INDUSTRY & COMMERCE

Left to right 1
Mr. R. B. SIMPSON,
Personnel Manager,
British Celanene Ltd.;
Mr. W. E. BENTON,
Technical Manager,
Sidney Flavel & Co.
Ltd.; Miss ANNE
SHAW, Director, the
Anne Shaw Organization (Chairman)







the top executive, but when he did he should not try to undertake his specialist function simultaneously with that of managing the whole team of specialists.

The question of the relation of the specialist to management



Mr. A. G. HAYEK, Director, Thackwell & Hayek Ltd.

cropped up in several other meetings. Mr. A. G. Hayek, a director of Thackwell & Hayek Ltd., suggested that the managing directors of small and medium-sized firms might make greater use of personal assistants to co-ordinate the work of the specialists. These personal assistants would have no authority of their own, but would be responsible for seeing that decisions of the managing director were carried out, and interpreting such decisions to the specialists. They would perform the same function as staff officers in the army. Large companies had already experimented successfully with personal assistants of this type, and smaller companies, it was suggested, might find them even more useful, both from the points of view of better organization and as potential managers.

GOVERNMENT RELATIONS

A NOTHER paper, read by Mr. D. S. Richard, of Courtaulds Ltd., suggested that in large organizations a special staff officer of this type con'd profitably be used to run a Government Relations Department. His task would be to advise on and correlate all the manifold contacts between the various de-

partments of the firm and the various departments of State. In the same field, too, lay a paper read by Mr. W. E. Benton, technical manager, Sidney Flavel & Co., Ltd., on the function of a research department in a small firm.

BETTER JOINT CONSULTATION

THE third point made by Mr. Butler in his opening address was that too much attention had been paid by workers to the ownership of industry, and not enough to its management. Something had already been done to remedy this through joint consultation, but by and large joint consultation had not yet penetrated the consciousness of the workers as a whole.

This theme provoked lively discussion throughout the conference. Sir Robert Sinclair incisively, if indirectly, attacked the whole conception of joint consultation as a part of management. Though he made no actual mention of joint consultation, he stressed that in any



Mr. JOHN RYAN, Vice-Chairman, Meta Box Co., Ltd.

business the line of authority must be kept clear, and stigmatised the practice recently adopted in Germany of having one or more of the directors appointed as representatives of the workers as sheer nonsense. "You cannot," he declared roundly, "have class representation at any level of management."

In spite of this, the conference went on to consider how to improve class representation in the machinery of joint consultation. Two panel debates, one on the creation of an effective sense of common purpose in industry and the other on methods of inducing the more responsible workers to stand for election as workers' representatives, resolved into discussions on how to improve joint consultation, without, it must be admitted, reaching any very concrete conclusions.

A much more specific approach came from Mr. W. C. Gibbs, director and general manager of Henley's Tyre & Rubber Co., Ltd.,



Mr. W. C. GIBBS, Director and General Manager, Henley's Tyre & Rubber Co. Ltd.

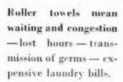
who described the co-operative award scheme for hourly paid workers introduced by his firm some three years acc. This scheme, which was introduced and is run with the full co-operation of the workers, was described in an article in Business in September, 1949.

Mr. Gibbs was faced with a barrage of questions and criticisms from the experts, since there are many features of his scheme that are not according to Crocker. He had, however, two points that by general consensus gave him the best of the argument; he did not claim that his own approach was of universal validity, and, by any test, the scheme had worked out successfully for three years. Results included improved quality, higher output per worker, increased earnings, lower costs and a "better spirit in the place."



How to cut absenteeism

The main cause of lost time in industry, according to the Medical Research Council, is sickness absence. Much of this absenteeism can be traced to the transmission of contagious ailments through the use of communal towels.





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TRAINING THE MANAGER

OUESTIONS of the training of personnel were covered in three separate papers. Mr. H. F. L. Mayity, divisional manager (Southern England), Thomas Hedley & Co., Ltd., described the methods adopted by his firm for training sales staff in the field of staple consumer goods; this is a three-stage programme, covering initial training before going on the road, preliminary training on the road for new representatives, and



Mr. G. J. MILLS. Assistant Comptroller, J. Lyons & Co. Ltd.

a constant series of inspection-cumrefresher-training conducted by unit managers.

Two other speakers discussed training for management, Mr. W. Leonard W. Buxton, Under-Secretary to the Ministry of Labour, asked whether T.W.I. should cover all grades of management, without supplying an answer. The meeting decided that it should, but was undecided about ways and means of extending the present courses hove foreman level.



Principal J. WILSON. Birmingham Technical College, and Lt.-Col. L. URWICK, Chair-man, Urwick, Orr & Partners Ltd. (in the

This indecision came as a proof of the thesis put forward with some vigour on the previous day by Principal J Wilson, of the Birmingham Central Technical College, The demand for management training, he asserted, was outpacing the supply of qualified teachers. More teachers could be trained, providing facilities were provided, but before these were forthcoming industrialists would have to do a great deal more thinking as to the type of course they wanted their future managers to take. Such courses can be given either through existing universities, through special graduate colleges such as the Harvard Business School (described in an article in the December, 1950, issue of Business), through technical colleges, or, in certain cases, by individual firms. Each policy has its advantages and disadvantages, but none will prove effective until some decision as to the scope and content of the type of course offered by each can be determined. And this can only be done by the customer-the industrialist who will employ the emerging students. .

USING ELDERLY WORKERS

PERHAPS the best panel debate of the session was also on an aspect of human relations, under the rather unpromising title of "the ageing population and its implications for management. E. Grebenik, Reader in Demography at the London School of Economics, analysed population trends in recent years and probable developments within the next 30 years, which showed that industry would have in future to deal with a greater proportion of elderly workers. Dr. C. A. Boucher, of the Ministry of Health, in a paper read in his absence, showed that there was no medical cause for alarm at this prospect. Mr. E S. Baynes, formerly sales manager of Thomas Hedley & Co., Ltd., retailed his own experiences after retirement, and suggested ways in which industry could use the services of executives due for retirement, Mr. R. T. Chapman, personnel manager of Baker Perkins Ltd., described how his firm had successfully used the services of "elderly gentlemen" of 65 and over retired from the workshops in the post room and elsewhere to replace lads anxious to take up apprenticeships in the factory.

CUTTING PRODUCTION COSTS

As has been sain, S has been said, the second was the question of costs and how to reduce them. The grand set

piece here was what was later referred to as the world premiere of the Management Accounting team of the Anglo-U.S. Productivity Council, whose report is summarised on page 59. Three members of the team, Mr. I. T. Morrow, of Robson, Morrow & Co.; the leader, Mr. S. J. D. Berger, secre-



Mr. R. M. CURRIE. Head of Work Study Dept., I.C.I. Ltd.

tary of the Institute of Cost and Works Accountants, and Mr. C. F. Barnard, assistant general manager, Mirrlees, Bickerton & Day Ltd., spoke and answered questions on the report.

It was unfortunate that most de'egates had not had time for more than a cursory examination of the report, since this factor obviously influenced the standard of discussion. Interest ran high, however, and the team are obviously destined to meet a warm reception during their projected tour of the provinces.



Mr. K. MARSHALL. Director, Joint Iron Council

Much of the panel debate turned on the day-to-day figures presented to executives as a result of work measurement and work study on the job, and a paper on this aspect read by Mr. R. M. Currie, head of the work study section of LC, L. Ltd, gave an elementary account of developments in this field which, if offering nothing very new, put such matters as time study, methods study and process study in a proper perspective.

Mr. Kenneth Marshall, director



Acrofilms Ltd

New Government Offices at Whitehall Gardens and the L.C.C. South Bank Reconstruction Scheme for the 1951 Exhibition, are two of the many important contracts now being carried out. * Building

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of the Joint Iron Council, took the discussion a stage farther by describing how, in certain cases, the figures obtained by work study and cost accounting had been used for comparisons between different manufacturing units in the same industry, Mr. F. L. Griffiths, works engineer, Fraser and Chalmers Engineering Works Ltd., rounded off the debates on costs with a paper on the cost of maintaining plant and machinery.

... AND THE REST

F such varied import was the remainder of the conference that it can only be covered by a catalogue of papers. These included a debate on design and its contribution towards economic production and marketing, a paper by Mr. G. J. Mills, assistant comptroller, J. Lyons & Co., Ltd., on the respective merits of centralization and decentralization in the office, a paper by Mr. John Ryan, vice-chairman, Metal Box Co., Ltd., on retail price maintenance, a debate on what we can learn from the Americans about packaging, by members of the Anglo-U.S. Productivity Council team on packaging, a paper on sources of finance for the medium-sized business by Mr. J. T. Corbett, partner, Peat, Marwick, Mitchell & Co., and finally, an exhaustive (and exhausting) survey of the economic background to management by Sir Wi liam Coates, director, Westminster Bank Ltd. and lately a director of LC.I. Ltd.

SUPPORT FROM THE STAFF

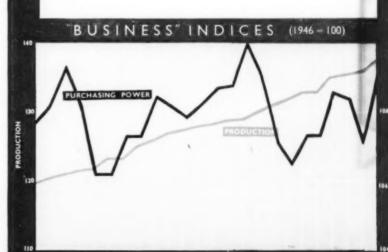
A N executive of a firm which runs a staff training scheme announced that he would give a talk in a midland town on early closing day. Employees of the firm's local branches were invited to attend. Within a few days the news got around and branch assistants in all the towns within 20 miles were asking whether they also might come along. In the end 250 people came, Fifty had been expected.

This story was told at the annual general meeting of the Industrial Welfare Society by the chairman of the council, Lord Trent, who said it seemed to him to exemplify what someone once called esprit de firm.

JANUARY, 1951

SALIENT FIGURES OF THE MONTH

"BUSINESS" INDICES	Latest Month	Increase (+) or Month Ago	Decrease (-) on (
Production (1946=100)	• 137.1	+ 0.6	+ 10.4
Purchasing Power do.	* 108.2	same	+ 0.3
MANPOWER Total manufacturing			
industries (thousands)	• 8,500	+ 57	+ 189
Cotton spinning and weaving do.	* 332.1	+ 1.6	+ 8.6
Coal (on colliery books) do.	688	- 4	_ 22
Reg. unemployed (U. K.) do.	327.0	+ 18.7	+ 3.7
PRODUCTION			
Index of production (1946 - 100	* 144	20	+ 12
Ccal (average weekly	,		7
cutput) (thousand tons)	4,347	+ 126	- 17
Steel ingots and			
castings (do.) do.	323	+ 2	+ 21
Cotton yarn (do.) (million 15	15.21	+ 0.64	+ 0.41
Woven wool fabrics (do.) (million linear yards)	31. 3	+ 5.40	+ 0.54
Passenger cars (do.) (thousands)	11.35	+ 1.44	+ 1.93
Commercial vehicles (do.) do.	5.44		
Permanent houses	5.44	+ 0.57	+ 0.50
completed do.	17.60	+ 0.20	+ 1.17
TRADE			
Value of imports (£ millions)	223 0	+ 29.1	+ 24.1
	202.2		
Value of exports do.		+ 30.8	+ 46.1
Freight train traffic (million tons)	5.49	+ 0.21	
Retail sales (1947 = 103)	142	+ 3	+ 10
FINANCE			
Currency in circulation (£ m.) Deposits in London Clearing	1,247	- 7	+ 6
Banks do.	6.2)4	+ 176	+ 154
Provincial cheque clearings (av. working day) do.	6.30	+ 0.37	+ 0.50
	0.00	0.57	1 0.30
WAGES AND PRICES			
Weekly wage rates (1947 - 103)	111	+ !	4 2
Retail prices (1947 100)	115	+ 1	+ 3
Wholesale prices (1930 10)	+ 28 .9	+ 8.9	
Basic materials do	+ >43.4	+ 50.4	
Intermediate do.	+ 325 2	9.7	+ 57.1
Manufactures do.	+ 2 -2.5	+ 3.5	+ 16.0
Import prices (1938 = 100)	1 43	+ 6	+ 25
Export prices do.	123	+ 2	+ 10
* September. † November.	Ali othe	r figures re.e	to October.



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BUSINESS

The Journal of Management in Industry

FORECAST FOR 1951



Twenty Points for Top Management By BUSINESS Editorial Staff War and rumours of war form a grim background to the New Year. In this

To the businessman peering into the future, the New Year seems to offer but cold comfort. After 15 years of limited raw materials and labour, extensive Government control and high taxation, any hope of a return to normalcy is once again deferred by wars and rumours of wars.

The restrictions that have for so long bedevilled the ordered development of industry have been perceptibly eased in recent months. Now they must be maintained and even intensified if the demands of rearmament are to be met. The Government will play an even greater part in the life of the businessman.

It is, therefore, to the Government rather than to the market that we must turn for light on future developments. A leading industrialist whom Business asked for his views on the prospects for 1951 replied: "Tell me who will win the next election, and I will give you my forecast." But the dominant factors that will determine the economic climate in Britain during the next few years are outside the control of any one political party. Whatever Government are in power in 1951 will be faced with a

large-scale rearmament programme. There may be differences in policy, but these will be differences of degree and not of kind.

The present Government have given their views on what rearmament will mean to the businessman. In the October issue of the Bulletin for Industry, the monthly review of the economic situation prepared by the Economic Information Unit of the Treasury, a 20-point summary is given of the problems to be faced. Some of these points are sound; some disputable; some naive. But at least they form a useful text which, with suitable glosses, may form some guide for action. If it is but a poor map, it will be better than nothing.

Here, set in bold type are the Treasury's 20 points. Each point is then analysed and commented on by a Business research team. Finally, in italics, Business suggests how management should act.

PRIORITIES

"1. Much of the extra demand will be felt by parts of the engineering and vehicle industries, already working at full stretch."

From 1951 to 1954, a total de-

War and rumours of war form a grim background to the New Year. In this article, BUSINESS editorial staff assess the impact of increasing rearmament on business prospects for 1951. It is in trying times that good management comes into its own; here, in 20 points, are the problems and —within the limits of the situation—the answers.

Conditions will change constantly and rapidly—business must be prepared to be flexible. Manpower and machinery will be scarce—business must improve its personnel relations if it wants to keep its labour force, must concentrate on better methods to get the most out of its machines. Rising prices will mean a greater call on money resources.

In conclusion, nine leading businessmen, in exclusive statements to BUSINESS, give their views on 1951. fence bill of £3,600m is envisaged, an increase of £1,260m, or £420m. a year, on expenditure already budgeted. In other words, expenditure on defence will be increased from seven per cent. of the entire national income to the unprecendented peace-time figure of ten per cent. It has already been admitted by Government spokesman that the final figure may well be even higher, owing to the rise in prices of raw materials since the original announcement.

The incidence of this extra expenditure will be gradual. In 1950/1 only £70m, extra will be spent, but the figure will rise rapidly to £220m. in 1951/2, £350m. in 1952/3, and £600m. in 1953/4. About two-thirds of the extra will represent expenditure on engineering products.

Over £50m, of orders had been placed by last October. Contracts so far seem to have gone mainly to aircraft works, shipyards, ordnance factories and makers of radar and similar apparatus.

Businessmen, particularly in the engineering and allied trades, should examine their organization

35.2 15.8 11.3 7.2 6.0 5.0 to see how to squeeze out the extra output demanded.

"2. It seems inevitable that any arms programme on the scale contemplated must give rise to some production bottlenecks."

A considerable switch in manpower is clearly involved. Shortages of certain types of key workers are bound to arise, and additional strain on drawing offices, tool rooms and so forth will be inevitable. The scale and duration of this dislocation are a matter for speculation, but Sir Robert Sinclair, president of the Federation of British Industries, told a regional meeting of the F.B.I. at Huddersfield recently: "I think that it is not inconceivable that the effects even of the programmes already announced may be under-estimated.

Shortages of labour, of raw materials, of machinery, and of components will demand flexibility in management,

"3. There may also be some dislocation in the course of changing over from civilian to war production."

-Everyone is anxious to avoid allocations and rationing-even if only because they would be so difficult to administer. Priorities based on end-products would create administrative problems of the first magnitude, requiring large staffs—a further drain on limited manpower resources. During the war, no such problems arose, as the Government purchased virtually the entire output of industry. To-day the export and limited home market will stay comparatively free.

Pre-planning and flexibility in the alteration of plans to meet changing circumstances will be more important than ever.

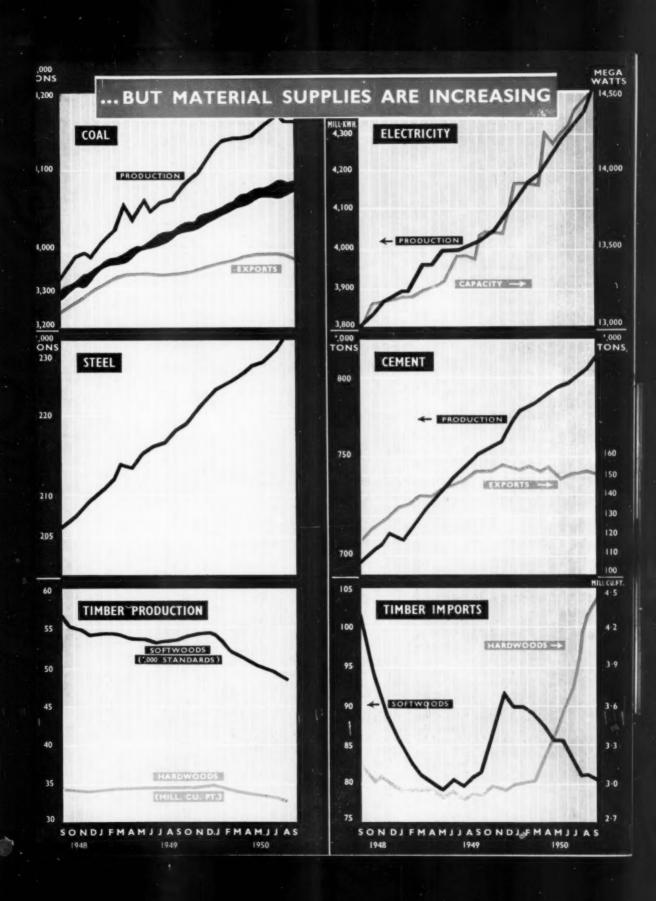
"4. But there is probably a reserve of unused knowledge and skill here and there, perhaps some reserve energy, and in critically important places a failure to use manpower and equipment to the full."

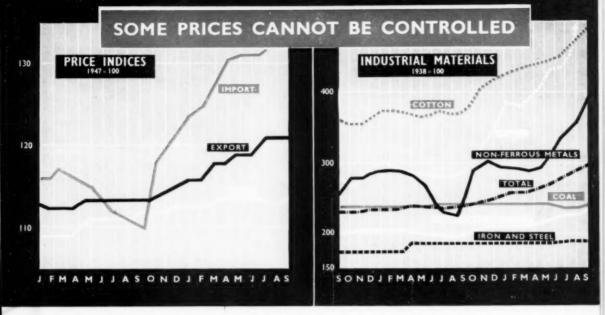
With additional labour and new machinery difficult or impossible to obtain, increased output must come from higher productivity. And, as is stressed in a recent report, Economic Battledress for the Cold War, published by the Association of British Chambers of Commerce, "Productivity in industry is pri-

MANPOWER WILL BE SCARCE

Manufacturing	ind	ustries	-	*****
Professions	-	-		有有有有有有有有有有有有有有
Distribution	-	-	-	*******
Transport	-	-	-	***
Building	-	-	-	***
Agriculture	-	-	-	前方前方
Public adminis	stra	tion	-	***
Mining	-	-	-	常常常
H.M. Forces	-	-	-	##
Utilities	-	-	-	*
Unemployed	-		_	†

Each symbol represents 250,000 workers—the number that will be required to man the rearmament programme when it is fully under way. From where are they to be withdrawn?





marily a task for management. That is why they are there.

"By research into processes and materials and increased use of those discoveries, by devising machinery to save human effort, by careful study of the treatment and selection and incentive remuneration of staff, and by careful husbandry of their resources, by standardising goods and methods, by studies of costing and by other forms of leadership they [management] should be the driving force to reduce costs and increase output."

There are obvious limits, under present circumstances, to the amount of mechanization that management can undertake, but three points are imperative:

1 —Utilize existing machinery to the utmost, by planning production schedules to avoid waiting periods, by improving maintenance to eliminate breakdowns, and by organizing, wherever practical, twoor three-shift operation.

2.—Utilize existing labour resources to the full by fitting the right man to the right job, and by linking remuneration with effort by means of payment by results, preferably on a group basis.

3.—Concentrate on new methods that, while using little or no new

equipment, will yield dividends in increased production; encourage suggestions from operatives.

With new equipment and manpower at a premium, it will be brain power, at all levels, that will count.

"5. Ordering departments will endeavour to place their contracts in such a way as to involve the minimum interference with other important work.

"6. Defence orders and exports to dollar markets now rank together at the top of the priority list.

"7. Firms are asked not to accept arms orders which involve the abandonment or postponement of high priority exports without referring back to their usual department."

In spite of the fact that the dollar gap has now disappeared—the United States is currently importing more than she exports—the export drive to dollar areas will have to be maintained and intensified. Recent developments in the U.S.A. have been caused partly by "scare-buying," partly by Government stock-piling. Dollar receipts by the sterling area have also been enhanced by the current high prices of Commonwealth raw materials. All these factors will have only a temporary effect.

As Mr. Paul Hoffman, former

chief of the U.S. Economic Cooperation Administration, has said: "Two years ago I suggested \$1,800m. as the annual export target, Britain has now reached a monthly rate indicating \$900m. per annum of such exports. I still think the former figure is necessary." So, apparently, do the Government.

Every businessman should look to his export department, and small firms should consider joining together in a group export scheme.

MANPOWER

"5. About a quarter of a million more workers will be engaged on arms production when the programme reaches its peak."

It is difficult to see where these workers are to be found without a policy for redistributing manpower more drastically than anything the Government have so far contemplated. In the Midlands and North Midlands, where much of the engineering work for rearmament will have to be done, the number of unemployed is already no more than 0.5 per cent. of the available working population, and in the Birmingham region alone there are more than 45,000 jobs with no one to fill them.

continued on page 91

LEADING INDUSTRIALISTS LOOK AT 1951

Nine Exclusive Statements to BUSINESS



Sir CECIL WEIR, K.B.E., M.C., D.L., Chairman, Dollar Exports Board.

THE end of a year is stocktaking period throughout British business. It is a good time also to examine the progress that has been made in enterprizes of national importance such as the campaign for viability—the closing of the dollar gap. Every firm and company in this field, either already or potentially, should do this in respect of its own contribution and so should public and Government bodies.

Much was accomplished in 1950. More, indeed, than could have been expected a few short months ago. Some of the achievement was due to the initiative, effort and enterprize of U.K. manufacturers and exporters. Some of it was due to the good work of producers in other parts of the Commonwealth and the sterling area. Some of it was quite fortuitous and the credit, if it can properly be termed "credit," must be given to conditions and circumstances which a free and peaceloving people like the British would have preferred should never have been forced upon them.

It is the last fact that makes it so necessary that we should per-

severe with the first of the elements in the achievement described above —the drive for more exports of British goods to the dollar markets and, of course, to other exports markets as well.

Therefore my message to business and industry in the United Kingdom is, first, one of thanks for fine voluntary co-operation with the Dollar Exports Board in an export effort which has already had encouraging results, and, second, one of request (which I am sure will be responded to) for the continuance in 1951 of that co-operation.

Sir PATRICK HANNON, President, Nat. Union of Manufrs.

WHILE the present industrial situation is in general terms encouraging, and over a wide field of enterprize maintained at a record level, the outlook for 1951 must be approached with qualified anticipation.

The intervention of the state in almost every phase of our national economy intensifies the growing anxiety of the direction and management of productive enterprizes. So far as can be foreseen, the burden of taxation will weigh heavily upon industry for an interminable period of time.

The problem of the relationship which must be adjusted between preparation for defence, and the continuity of the dollar export drive, will bring severe headaches to many manufacturers. The question of the appropriation of man-power and the allocation of raw materials will exercise acutely the skill and foresign of management.

The assessment of death duties

in the cases of the smaller manufacturer, of which there are several thousands, is being viewed with dismay where the full operation of the low as it stands will in many instances result in liquidation.

The deficiency in coal production and the cuts in electricity supply will gravely affect the volume of industrial output. Complications which have arisen under the Town and Country Planning Acts affect the extension of factory accommodation and restrict opportunities of ploughing back accumulated reserves. Moreover, there is looming over the horizon grim shadows of German and Japanese competition.

Notwithstanding these depressing reflections, the experience and



intellectual vigour of our industrial leaders, the high standard of technique in our industrial management, and the skill and craftsmanship of the vast mejority of British workers, give me the abiding feeling that the place of Great Britain and the Empire as the dominant economic factor in the world of today shall survive our tribulations in the world of tomorrow.

(Continued on next page)

Mr. L. P. LORD,

Chairman & Managing Director, The Austin Motor Co., Ltd.

THE British motor industry is likely to enter 1951 with a large backlog of orders, and I am referring now to exports, not the fantastic situation in the home market.

Therefore, unless a world upheaval occurs—either political or economic or both—business will be good in 1951, although it may prove the year of resurgent competition in world markets from American and European manufacturers.

With projects now nearing completion, the British motor industry during 1951 will be in a position to expand its output. Whether that expansion will be achieved depends on Government policy in allocating the extra steel sheet supplies from the new rolling plant in South Wales that will come into effective operation during 1951. If this new source of supply is rendered generously available to the motor industry, then the present output rate of 750,000 vehicles per annum may well top the million mark.

As a result it may prove possible more fully to satisfy both the re-



quirements of rearmament and of world demand. If the spiralling costs of materials and services can be halted, or at least countered by the economies resulting from increased and more efficient production, and our overseas prices established, the place that the British motor industry has secured in world markets should be consolidated.



Sir FRANK S. SPRIGGS, K.B.E., Hon, F.R.Ac.S.,

Managing Director, Hawker Siddeley Group Ltd.

REARMAMENT dominates the thoughts of the aircraft industry and our group for 1951. Fortunately, in our case, productive capacity is available for Government orders, Western Union and Empire defence because, since the war, we have ploughed back into our organizations substantial funds to gear our productive capacity to future defence requirements.

In research and development, we are confident that Britain's lead in jet power is even more firmly established. The recent disclosure of the new Armstrong Siddeley Sapphire jet engine as the most powerful in the world is the latest concrete evidence of British leadership. The crucial decision to be made by Government is when to freeze certain development and switch the industry's emphasis from development to production. When the Government makes that decision, we are ready for it.

We look to 1951 with confidence, not only in our own organization but throughout the industry.

Sir ALLAN GORDON-SMITH, K.B.E., D.L.,

Chairman, S. Smith & Sons (England) Ltd.

IT is very difficult to forecast the prospect for the light engineering industry in 1951.

Personally, I take the view that, whatever the magnitude of the rearmament programme, any development is bound to be gradual and more in the nature of preparation

for production rather than largescale production.

Therefore, I do not think that the manufacture of light engineering products will be seriously affected during the year. There are bound to be increases in the prices of raw materials—particularly nonferrous metals, where increases have already been 100 per cent. The more efficient British manufacturers have, by improved methods, been able to keep their prices of manufactured engineering products at a reasonable level—in some cases no higher than immediately post-war.

Manufacturers will also have to realise that, in the case of con-



sumer goods, the market has changed from a sellers' to a buyers' market, and, therefore, buyers will, more and more, purchase goods of standard quality made by manufacturers of repute.

Taking all these circumstances into account, including the question of rearmament, I see no reason to be pessimistic about the prospects of the light engineering industry for 1951

Sir CHARLES COLSTON, C.B.E., M.C., D.C.M.,

Chairman & Managing Director, Hoover Ltd.

THE outlook for British industry in 1951, although largely governed by the way in which the international situation develops, gives, nevertheless, every reason for great hopes. The democratic countries of the West are now alive to their danger and in taking steps to defend their heritage of freedom will, in my view, avoid a general conflagration. I believe that production efficiency will increase steadily and that despite a substantial expenditure on armaments there will be a large volume of peace-time products.

A most encouraging development has been the closer economic



link-up of Western Europe, and, if the efforts to remove the barriers in the way of trade bear fruit, there will be further tremendous possibilities for British exports.

In my own particular industry of domestic electrical appliances and light engineering, I have every confidence that 1951 will be a year of great achievement.

Sir ROBERT J. SINCLAIR, K.C.B., K.B.E.,

Chairman, Imperial Tobacco Co. (of Gt. Britain and Ireland) Ltd.

HOPE that in 1951 it will be possible for supplies of tobacco goods to be maintained at not less than the present somewhat restricted level. Nevertheless, it is inevitable that, if the present fan-



JANUARY, 1951

tastically high rate of duty continues for long, the law of diminishing returns must come into operation—and that is the least satisfactory way, on all counts, of equating supply to demand.

There can be little doubt that the general economic outlook is overshadowed by the threatening clouds of increased inflationary pressure. That pressure must tend to be intensified by the impact of increased defence expenditure on an already strained economy. Yet, surely nothing should allow us to relax our resolve to be prepared-and in time. The need therefore to reduce other forms of Government expenditure will, as I see it, be paramount, since taxation at a level equivalent to over 40 per cent. of national income is uneconomically

Mr. W. B. WOODS, President, Office Appliance Trades Association.

ROR the office and factory equipment industry 1951 should be a very instiring and encouraging year.



The need for all our products will be greater than ever, and it is no exaggeration to say that commerce and industry could not function without the equipment supplied by our industry. The ever-increasing need for accurate records and up-to-date methods in all phases of manufacture, distribution and finance, must lead to continued progress in the design and scope of the available products, and this in turn will lead to greater benefits and economies to the user.

Production is steadily increasing to meet the demand, and during 1951 new manufacturing facilities will be coming into effect which should be of great benefit to the home and export markets.

The highlight of the year will be the Business Efficiency Exhibition, at the Grand Hall, Olympia, in June. The largest exhibition of its type ever to be held, it will be a worthy contribution to the Festival of Britain.



Mr. G. W. A. MILLER, F.C.L.S.,

Chairman & Managing Director,

Eastwoods Ltd.

PROSPECTS for the building industry appear favourable from whatever angle we view them. Commodity manufacturers are mostly occupied to capacity, with perhaps timber as the only bottleneck in supply.

Brickmakers, at present running at 80 per cent, or less (through labour shortage and past vacillation in official policy) are being asked to boost production by another 1,000 million bricks.

Cement, already fully engaged, is expected to touch a new peak at 10 million tons, including additional plants now coming into operation. The present method of controlled local authority house building is bad industrial psychology, and a scheme of priority allocation to the workers producing the building materials is urgently needed. Somehow the gap between reward and performance must be filled and a more sympathetic approach to the housing problem would prove the finest incentive to labour.

Look Out for WHAT'S NEW



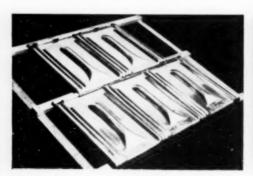
SAFE HEAT

IF you lift, tilt or knock over the Safera electric fire the current is automatically cut off and remains so until the fire is settled squarely on its feet again. This is one of several safety features which have been incorporated in the design of the fire, which is attractive in appearance, efficient in operation. Other accident prevention points are the graduated guard, element shield and shock absorbing feet.



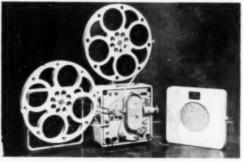
LOUD AND SMALL

DESIGNED to amplify speech or music, the Shaftesbury Speechmaster is a new portable and self-contained unit measuring only 84 x 6 x 8ins. It operates on any a.c. or d.c. voltage between 200 and 250 volts. It can be used to advantage at conferences, sales lectures and business meetings, and saves wear and tear on vocal chords. It is sold complete with microphone at a reasonable price and weighs only 6lb.



ALLOY TILES

LIGHT alloys have entered a new field with the introduction of pressed aluminium roofing tiles. These tiles have several advantages including strength, lightness and immunity to rusting. Each tile is 10 x 14ins, and a clip-on top edge is incorporated which can be nailed to wooden roof struts. The bottom edge has a fin, flange tucked under the top portion of the lower tile. They should be particularly useful in tropical countries, and their light weight makes them suitable for overseas shipment.



DESK TOP PROJECTOR

A PORTABLE 16mm, sound film projector is the Sofil Minor, which is no larger or heavier than the average portable typewriter. The entire equipment—projector, amplifier, loudspeaker, transformer and leads—packs into a single 11 x 11 x 9ins, case, weighing less than 26lb. Development of the Minor took five years and it is the first all-British machine in the light weight category. Its size coupled with its low price makes it suitable for industrial concerns who want a simple unit for desk top use.

How Statistics Help the Businessman

By PHILIP F. DYER

SOME years ago, the United Steel Companies Ltd. were faced with a management problem. The rolling mills at one of their branches was producing 65 different groups of products. Each group had its own standard rolling rate per hour, and so complete were the calculations involved that any routine comparison of efficiency was impracticable.

To solve the problem, the company called in a statistician. By plotting actual results taken from works records for six months on a chart, the statistician found that actual rolling times, irrespective of product, fell into six main groups. There was, of course, no prima facic reason why this should be so; it just happened that way, There was, for instance, no material difference between the There average rolling rates for the different sizes of billets, and a single grouping sufficed for these. These results were checked statistically by techniques known as the Bartlett test of variance and the analysis of variance.

With the number of groupings for standard rolling rates reduced to six, it was possible to design a simple shift report which would give in tabular and graphical form the performance of the shift. This enabled regular comparisons to be made between the different shifts. which showed that output by the afternoon shift was consistently higher than that by the morning and evening shifts. Further statistical investigations revealed reasons for this superiority, and enabled management to carry out changes that improved productivity by the lagging shifts.

This is just one example of the way in which the statistician in industry is contributing to increased productivity and lower costs,

Few laymen have any very clear idea of what a statistician (and particularly a statistician in industry) does or can do. Most people associate statisticians with the accumulation of masses of figures. But—as most businessmen know only too well—figures can and do proliferate to enormous



This article in ONE MINUTE



Statistical methods first developed in the field of scientific research are now being used for the solution of day-to-day problems in business management.

The statistician can help the businessman by:

- Presenting complicated information in easily and rapidly assimilated form.
- Devising and operating simple control mechanisms for use on the shop floor.
- Evolving techniques for comparing the risks involved in alternative courses of action.

dimensions without the aid of a statistician. What the statistician does (or should do) is to

- (a) limit and control the activities of the people who produce the figures.
- (b) reduce the figures produced to a simple form that can be readily assimilated and understood by a busy man without mathematical training, and
 - (c) extract every drop of infor-





IN THE IRON AND STEEL INDUSTRY

statistical methods have improved methods of blast furnace operation and determined optimum conditions in rolling mills practice.

British Iron and Steel Federation

IN THE RUBBER INDUSTRY

statistical methods have been widely used for process control, while advanced statistics have yielded information as to the fundamental properties of rubber.

Fenley's Tree and Rubber Co., Ltd.

mation that can be gained from them

This is the function of all statisticians, in whatever field they are tistician has an additional function, of even greater importance-the measurement of relative degrees of risk.

Assessing the Risk

Risk is an inherent part of all business activity. On the production side, the businessman daily faces the risk of accepting faulty raw materials, bad workmanship, slipshod inspection, and an unacceptable finished product. On the sales side, he constantly faces the alternative risks of scamping quality to get down to a competitive price and maintaining high quality and pricing himself out of the market. And in the market itself, he runs the constant risk of under- or over-estimating the demand for his product.

The most successful businessman is the one who assesses the relative value of the risk involved in his activities, and takes his decision firmly in accordance. In the past, business analysis of risk of

this type has been partly intuitive and partly based on past experience. The industrial statistician has now reduced the intuition working. But the industrial sta- needed (though not, of course, eliminated it completely), and systematized the use of the results of past experience.

> The first efforts to measure risk were made in the 17th and 18th centuries by "natural philosophers" at the behest of aristocratic patrons, who put their results to the test on the gaming tables. Hence most text-books on statistics to-day are still written in terms of tossing a coin and drawing a particular card or eards from a pack.

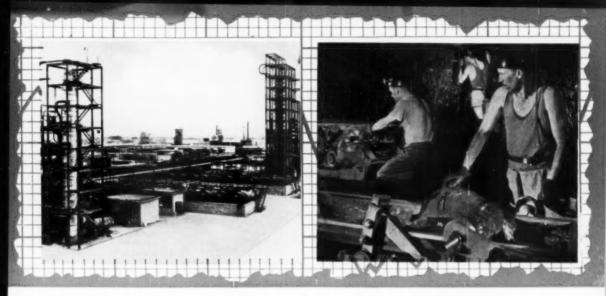
> The lessons were soon applied in a more commercial field by the new insurance companies anxious to assess the expectation of life of a prospective policyholder. With the growth of insurance to cover other fields, analysis of the risks of accident, fire, burglary and shipping became of great importance. For many years, however, this scientific analysis of risk was limited, in the business field, to insurance companies, and the development of the techniques was left to the scientists.

> The new science of genetics gave a great impulse to the study of the

theory of probability, and it was the application of the lessons of genetics and other sciences to practical farming problems at the Rothamsted Experimental Station that led to the development of the methods now being widely used in industries of every type,

The problems facing Professor R A. Fisher and his colleagues at Rothamsted were of a type familiar to most industrialists. A new type of fertilizer would, it was suggested, improve crop yields. The only way of testing this hypothesis was by sowing two plots of land, one fertilized and the other unfertilized, with the crop and comparing the yields obtained. This is a familar laboratory technique in all sciences. But in the laboratory, the scientist can control his experiment at all stages. He can use pure substances and maintain factors in which he is not interested, such as pressure, temperature, etc., constant throughout the course of the experiment.

In field experiments this is not possible, Commercial fertilizers are not pure and vary slightly in composition from batch to batch. No two plots of land are identical in fertility or any other character-



IN THE CHEMICAL INDUSTRY

industrial experimentation has revealed the best methodsfor large-scale production of many chemicals, from penicillin to phenol, from paints to explosives.

Petrochamicals Ltd

IN THE COAL INDUSTRY

comparisons of different methods and machines for coal getting have led to the choice of the best, with a corresponding increase in output.

National Coal Board

istic. Seeds, too, vary considerably in germinating power and in quality. Moreover, even when the seed has been sown, weather conditions, the attack of insect pests, the incidence of pollinating agents and other factors will affect the two plots differently. Thus even when the respective yields have been ascertained, the difference between them may be due, not merely to the fertilizer, but also to any one or more of these extraneous factors.

"Significance Tests"

What Fisher did was to elaborate a technique whereby differences established in field tests of this type could be classified as "significant" (i.e., most probably due to an outside factor such as the fertilizer) or "not significant" (i.e., due to extraneous factors).

Testing only one fertilizer per plot per season was too slow a process and a technique was devised for speeding up the tests. Each plot was divided into a number of sub-plots like a chess board and five fertilizers were tested on five types of plant simultaneously, giving 25 tests in all. The arrangement of the sub-plots was found to be important and principles of the design of the experiment were evolved to give the best results. At the end of the season the crop yield from each sub-plot was measured and the differences between these figures for the sub-plot and the grand average for the whole plot were determined. Thus, by a technique known as the analysis of variance. Fisher was able to state that so much of this variance was due to differences between fertilizers, so much to differences between types of crop and so much (the residual) to extraneous factors.

By comparing the amount of variance due to any one of the factors with that due to the residual, it could be stated whether this variance was significant or not. In the example quoted only two factors—fertilizers and types of plant—were involved, but the technique can and has been extended to include practically any number of factors acting simultaneously.

The technique was extended fairly rapidly to cover industrial operations. In many industries the manufacturing process cannot be duplicated in the laboratory and in these cases is still largely a matter of tradition, trial and error. The iron and steel industry is a case in point. It is difficult, if not impossible, to know exactly what is happening in a blast furnace during its operation, since the tremendous heat prevents accurate observation or measurement. There are, moreover, a very wide range of factors determining the quantity and quality of the output, such as variations in the composition of the charge, the heat and pressure of the air blast and so on. One statistician worked out 28 such variables in blast furnace operation. However, by studying records of past operations-the normal records that would be made in any case-the statisticians have, by the analysis of variance, been able to determine just how relatively important the various factors are in determining the quality and quantity of output.

Another field in which the analysis of variance has been largely used is in the chemical industry, where the Royal Ordnance Factories and Imperial Chemical Industries Ltd. have both published handbooks for the benefit of their employees, setting out the methods





IN THE TEXTILE INDUSTRIES

statistical methods applied to work measurement have facilitated redeployment in the cotton and wool industries, with corresponding effects on productivity.

International Wool Secretariat

IN THE ENGINEERING INDUSTRIES

quality control and other inspection techniques based on sampling theory have given improved quality, while applications to time study promise further gains.

Tube Investments Ltd.

to be followed. Even where, as in this industry, preliminary experiments can be made in the laboratory, the transfer from the laboratory to pilot plant operation and thence to full-scale operation, introduces new factors and snags which the laboratory experiments did not and could not foresee. It is only by trials and the analysis of such trials that optimum conditions for full scale operation can finally be determined.

Money-Saving Factor

The prime lessons that may be learnt from such analyses is the relative value of time and money spent in controlling such conditions. It may be revealed, for instance, that in one process, variations in pressure within fairly wide limits have no appreciable effect on output, but that variations in temperature are critical. The manager will thus be in a position to save money on expensive compressors and invest it instead in sensitive thermostatic control units.

The analysis of variance uses complete records as a basis for its tests. In a number of cases, however, industrial testing involves the

destruction of the product and must necessarily be limited to testing by a small sample of total output. The electric lamp industry is a leading example of this, since the only way to determine how long a lamp will take to burn out is to burn it out. Largely as a result of work done by Dr. B. P. Dudding and W. J. Jennett of the General Electric Co., Ltd., the technique of quality control charts was devised to meet this necessity. By continually testing a series of small samples drawn from the bulk of current output it was possible to determine, firstly, the average performance of the product, and secondly, whether any particular sample differed significantly from this general average. Since the samples were being taken regularly. management was given a very rapid indication whenever the manufacturing process got out of control for any reason, and could take steps to remedy this without undue loss.

The quality control technique gained great prominence during the war when it was extended in the enginering industry to machine tool control and other uses. It is still widely used in many industries where repetitive tests (not necessarily destructive) are taken, though a more recent technique, that of sequential analysis, will obtain results of the same accuracy with, on the average, smaller samples.

The problem of assessing the characteristics of the whole from a small sample is one that runs throughout industry. The manufacturer considering the introduction of a new product is deeply concerned to know whether potential customers will actually buy it. The simplest method is to ask them in advance. But for most products this is obviously impossible, and the only alternative is to ask a representative sample. But how big is a representative sample? And how accurate is the answer obtained likely to be? Modern sampling theory gives the answers, on which the whole structure of marketing research is based. It is thus possible to-day for the businessman to have an estimate of the market for the product, within definite limits, before laying out capital for new equipment.

Perhaps the most common type of data in industry, however, are

continued on page 90

John S. Coleman

American crusader for better management says:

"I believe in Britain"



Bans " Double Talk and Statistical Mysticism '

By THE EDITOR

THE Press Conference is now a widely accepted technique for obtaining publicity. Business undertakings, no less than Government Ministers, use it to announce some new venture or development.

It must be said, however, that the majority of such conferences in this country follow a somewhat prosaic pattern. Although few companies lack a good story, only a comparatively small minority really understand the public relations technique of how to "get the story across."

When, therefore, an invitation went out to the Press early in October to attend the London conference at which the official opening of the new Burroughs factory in Scotland was to be announced, one Editor at least accepted with some degree of resignation. Presumably, the usual bill of fare would be presented.

In fact, the audience of some 200 enjoyed a demonstration of public relations at its best. True, there were the customary photographs of factory buildings, of production machines and processes, of staff amenities and so on. There were

the usual skilled girl operators

putting actual models through their

But there was something else. The journalists heard a calm, unhurried presentation of facts by an urbane American businessman who not only had a sense of news values but was able to clothe the skeleton of a firm's trading policy with living flesh, and blood.

The man-53-year-old John S. Coleman, president of the Burroughs Adding Machine Co.-was himself news. Facing the normally hard-boiled journalists was one who, starting from scratch, had in recent years rocketed to the top as one of America's most successful business leaders. Here was a man of ideas, a leader who knew where and how he wanted his company to go, an expert not only in his own job but also in that of many of his team. His review, which could so easily have been a "take it or leave it" hodge-podge of lifeless statistics, became a fascinating and inspiring story revealing a wide grasp of business and international

Mr. Coleman touched on finance and currency problems, political economy, export markets, production, research, the human element, And to prove that he was not merely relying on a written brief, he afterwards answered many questions — some ticklish — promptly, fully, with quiet humour.

Many of those present probably thought of Burroughs as just another British branch of a U.S. concern. But Burroughs, as Coleman emphasized, first established a factory in this country as far back as 1898—only 12 years after the parent company were organ-

This article in ONE MINUTE

- John S. Coleman, President of Burroughs Adding Machine Co., Detroit, U.S.A., believes Britain means business in international trade.
- 2 He has launched a second British factory to make machines for the world market, including the U.S.A., thereby earning dollars.
- 3 By standardization and mass production, he boosts output, cuts costs.
- 4 His progressive personnel and public relations policies win support from workers, understanding from public. He believes in people, puts them "in the picture."
- 5 He crusades tirelessly for better, more enlightened management.

ized. In that year a complete manufacturing activity, from raw materials to finished products, was in operation at Nottingham. This factory is being enlarged and modernized and will join the Strathleven plant in the production of a complete line of Burroughs equipment—from the smallest hand-operated adding machine,



Burroughs products. The new factory at Strathleven, 16 miles north-west of Glasgow, comprises 150,000 square feet of floor space and is one of the show factories of the Scottish Industrial Estates. It is already employing 500 people and eventually will have more than 1,000 workers, half of them women. For some months past, experienced American technicians-specialists in the precision manufacture of business machines-have been at Strathleven training Vale of Leven engineers in the complicated technique of producing and assembling Burroughs machines from raw materials to finished products. Large quantities of highly specialised machinery and equipment have been shipped over from Burroughs' American factories, and are already in operation. A great deal more has been bought from British suppliers.

The expansion of the Nottingham, and the opening of the Strathleven, factories are part of an imaginative global trading plan which is the inspiration of John Coleman. The Scottish factory will not only produce adding and calculating machines for Britain and soft currency countries, but will also be the exclusive producer of several world famous Burroughs machines which will be exported all over the world, including to the U.S.A. itself. The two British factories in the past year have already shipped Burroughs products to 42 countries, these exports comprising about half the total output, Production in 1950 was 128 per cent, up on 1949. Total exports have increased by 268 per cent.

ment at Strathleven

If this British enterprise is to succeed, its products must be sold widely. In the U.S.A. alone, over 2,000 Burroughs salesmen are selling machines that will be supplied from Britain. Outside the U.S.A.

in many countries. If potential customers in those countries are to be satisfied, the machines must be produced in a soft currency area.

But why Britain, when the new operations could have been established in many other places? Mr. Coleman's answer is clear and to the point: "We believe in Britain. She has demonstrated that she means business in international trade, Her people have a reputation for skill and determination. We want the best results from our operations and in Britain we have a splendid chance of obtaining them."

The reasons for establishing in Britain the total manufacture of some models for world export are equally clear sighted, Britain could hardly be expected to supply the sterling area alone while the rest of the world was supplied from America, since it was impractical

to set up in this country a total self-contained operation. If Burroughs expected to ship some parts to Britain to complete the production of lines being made here, it was only common sense that something should be done for Britain in return. It was, therefore, decided to establish here the total manufacture of some models for world export, including to the U.S.A. and other so-called hard currency countries. Britain will thereby earn American and Canadian dollars and other hard currency.

After all, in Coleman's view, Burroughs are confronted with the same need for integration of business activities as is the Anglo-American community in the field of international relations. Whatever the field, the survival of our kind of civilization depends upon the fullest co-operation and teamwork. It is perhaps natural that an American who is proud of his English ancestry should have these thoughts. It is fine that he should act on them.

Selling policies and techniques

are vital to success in trade. But when a firm also make the products they sell, the principles of production must be right as well. John Coleman, whose earliest ambitions and training were aimed at a legal career-he was in fact called to the Bar-is not one to miss the logic of this. Though it was as a salesman that he joined Burroughs in 1920, his climb up the ladder took him through all departments of the firm and he brought a trained legal mind to the study of management and production problems. Since he was elected President of Burroughs in 1946 he has introduced many sound reforms.

For example, before the last war each machine was "custom-built"—that is to say, one man assembled a complete machine at one working point, This method resulted in hundreds of different models with thousands of variations of features, according to the wishes of individual customers. It caused a huge post-war production bottle-neck.

The backing of orders was vastly increased by the company's war-

time task of producing the famous Norden bombsight, which made a significant contribution to speeding the day of victory. Incidentally, under Coleman's impetus no fewer than 5,500 sights, each with 1,500 separate parts, were produced. By making the parts interchangeable, the cost of the sight was reduced by two-thirds.

Coleman fought the great backlog of orders by slashing the unwieldy number of machine variations, by combining the benefits of mass production with some of the features of "custom-built" methods. Plants were expanded, new ones built, more workers taken on. Standardization and mass production boosted output and cut costs. By January, 1949, the problem was solved.

Meanwhile, Coleman had also been busy with the human side of the organization. He recognised that his company depended even more than other manufacturing businesses upon people. In the making of a Burroughs machine the raw material is relatively un-



important. Nearly 80 per cent. of the finished product, in terms of cost, is in the skill of the people who make it.

Early in his Presidency Coleman said: "It is management's first duty to tell the men and women what the company's operations mean, to tell them frankly of their own responsibility in the social order." other words-put the staff "in the picture."

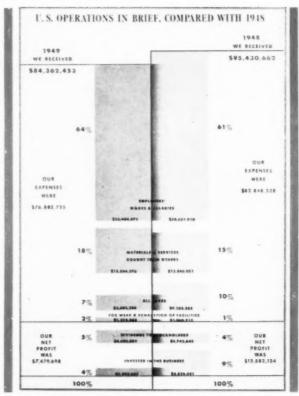
He implemented this procedure in many ways. Particularly successful were a film and the introduction of illustrated annual reports. The film presented a human story explaining the meaning and importance of profit. It was originally produced to show to all Burroughs employees and their families throughout the U.S.A. and Canada. Soon, however, demands for showings snowballed from other organizations, and to date more than a quarter-of-a-million people, including many in this country, have seen the film.

Prior to Coleman's election as President, Burroughs, like the majority of companies, had confined their annual financial reports to a mass of figures, and had made little effort to stimulate interest in the company's progress among employees, shareholders and the general public. Coleman worked to eliminate what he described as "double talk and statistical mysticism" from the company's accounting and financial statements.

In recent years, therefore, the annual story has been told in an understandable and interesting form and distributed to members of the staff and the public. These reports have won top awards in the national and local contests that are so popular in America.

Further, John Coleman has devoted a great deal of his own time and energy to stimulating greater public understanding of the financial operations of the modern business corporation. In articles and speeches he has again and again emphasised the importance of such explanations.

During his recent brief visit to this country Mr. Coleman took part



This page from the 1949 report shows how Burroughs dramatise their financial statements in easily understandable pictorial form.

in a second Press conferencecalled by J. Arthur Rank-at which an important new British industry was announced-the manufacture of microfilm equipment. Less than two years ago Burroughs in America and Bell & Howell made an agreement by which the former acquired the exclusive rights to the marketing and servicing of the latter's new microfilm development. In Britain, Bell & Howell's licensee is British Acoustic Films Ltd., a member company of the British Optical & Precision Engineers' Group, of which J. Arthur Rank is chairman

Manufacture of this modern equipment in Britain will make it possible for Burroughs still further to expand their mechanised accounting service to business organizations. Coleman is convinced of the need for a high quality mach-

ine to photograph records in easily storable form. Recent international developments have further emphasised the importance of safeguarding important records by copying on film for greater security.

Like most busy men with big jobs Coleman finds time to take an interest in a wide variety of activities. He is a director and deputy chairman of the Board of the Federal Reserve Bank of Chicago, member of the Economic Development Commission of the State of Michigan, President of the Employers' Association of Detroit, and, last but by no means least, a director of the Office Equipment Manufacturers' Instittute. Possessed of three separate skills - law, accounting, selling -he is a tireless crusader for better and more enlightened business management,

How a Small Firm

Organized for Export

In 21 years a fancy goods firm, while maintaining sales on the home

market, built up a prosperous export trade without increasing their

capital of £2,000 or incurring heavy overheads. Each stage of their

systematic, clearly defined campaign-a model for other small firms-

is explained in this article.

By H. CATLEEN, B.Sc.(Econ.), M.I.Ex.

MANY small manufacturers, though eager to sell abroad, are inclined to hold back owing to anxiety over the financial risk in which, they consider, they may be involved. That a prosperous export trade can be built up by the small manufacturer, with little or no risk of financial loss being incurred, is shown in the case history of a firm making a fancy goods product in everyday use.

The middle-aged owner and his two sons, acting on the advice of the writer, drew up a careful plan which they executed with such zeal that, in two-and-half years, they had developed a monthly export turnover of more than £2,000. This healthy figure, equalling their monthly turnover from sales on the home market, was achieved without any addition to capital (which remained at £2,000) and with very few extra overheads.

How was it done? Here is the story in five chapters:

1. The Preparation

(a) Sample collection. From the existing (too large) range of products for the home market, a careful selection was made with the main view of quick availability of materials and prices.

(b) Prices. The costing was worked out, based on the ex-factory price, plus seaworthy package cost, plus f.o.b. charges, plus agency commission. The gross profit rate was kept very low in order to be as competitive as possible from the start. Then price lists were compiled and duplicated (not printed) on the firm's letter headings.

(c) Payment conditions. In view

of the firm's slender resources these were fixed as follows.

(1) Three per cent, cash discount for orders through confirming houses for payment within seven days of delivery.

(2) For new customers (and all were new to this manufacturer), 20 per cent, cash with order and balance cash against documents on sight draft.

(d) The offer. The firm compiled an introductory letter, to be sent to prospective agency firms all over the world, which

 gave a short history of the firm, their production possibilities and a clear description of their range of products;

(2) made it clear from the outset that they would consider appointing the addressee (who had been warmly recommended to them) as sole agent, if he achieved a degree of initial success.

(3) referred to the export price list f.o.b. British port, and mentioned the commission, including that for future agents;

(4) asked for information about import licences, competitive lines, prices, etc., and

(5) explained their special post parcel scheme for supplying samples.

(e) Post Parcel Scheme. A proforma invoice was prepared, to be

included with every introductory letter, which set out an advisable sample collection order. This collection order varied in size and quality according to the country of destination.

In each case cheap markets received cheap lines only; large markets the full collection; and small territories only a few items. In the offer the agent was encouraged to order one or more collections as specified for his needs and a sample discount was already shown in the pro forma invoices. Postal expenses for the parcels, it was pointed out, would, however, have to be borne by the addressee.

The writer's reason for advising this scheme, which benefits manufacturer, customer and agent alike, is that the agent can experiment with new lines and can sell one post parcel to a number of smaller customers who would hesitate to place an initial bulk order. The CUSTOMER "buys small" to begin with, thus avoiding major capital outlet and minimizing the risk: economic experiment with new lines is then within his reach. The MANUFACTURER soon finds out his best selling lines and can concentrate on production. He quickly obtains valuable market research

Distribution of his goods is more widely spread. Little or no financial risk is involved.

continued on next page

£35,000 exports in three years

FIRST YEAR

Orders worth £2,500 received, delivered and paid for. Six agents appointed in six countries.

SECOND YEAR

Paid export turnover of £7,500 from eight countries. Ten agents appointed. No losses or bad debts.

THIRD YEAR

In the first six months, a paid export turnover of £13,000 from 16 countries. Seventeen agents appointed. Again no losses. From orders in hand, it is estimated that turnover for the whole of the third year will be at least £25,000.

2. The First Step

After completing their preparatory work (i.e., introductory letter, price list and pro forma invoices) the firm sent letters, each typed separately, to 150 reputable agencies (connected with the necessary outlets) in all the territories open to their product.

In response 61 sample collections were ordered from 28 territories. The individual value of each collection varied from £5 to £30. Total value was about £800. In addition, upwards of 30 agencies asked for further particulars before ordering a sample collection.

The parcels were despatched, together with swatches and one collective photograph of the firm's four standard products, to all who had shown interest.

The result at the end of the first year was that orders worth £2,500 were received, delivered and paid for; and six agents, in six countries were appointed.

3. The Second Step

Card index control. A correspondence follow-up scheme was introduced at the beginning of the second year, each firm who had been written to receiving a card. With the help of a card index signal system all correspondence, sample collections, trial orders and bulk orders were followed up regularly whenever reactions from abroad became overdue. Thus the agents became impressed with the efficiency with which the manufacturer pursued his aim.

Besides these routine follow-ups the manufacturer, every three months, sent all firms on the export mailing list a new offer or suggestion based on the latest export intelligence. This greatly facilitated sales and continually reminded the agents of the manufacturer's existence.

Results for the second year were a paid export turnover of £7,500 from eight countries, with 10 agents appointed. There were no losses or bad debts. The first six months of the third year brought a paid turnover of £13,000 from 16 countries, with 17 agents appointed. Again there were no losses. From orders in hand at the time of writing, the firm estimate that their export turnover for the whole of the third year will be at least £25,000.

4. The Finances

By encouraging the agents preferably to accept orders from customers having arrangements with British confirming houses, nearly all the bigger orders were paid within seven days of delivery to the wharf and only about one-fifth of the export turnover was delivered cash against documents, which meant waiting six to eight weeks for the money. As far as possible, the materials for making up the orders were only ordered from the suppliers after the export orders had been received and confirmed. By strict adherence to a production time table, the manufacturer, who had to pay for the materials after 30-45 days, managed to make up the order and deliver it to the wharf in less than a month after the material had

been received, so that the payments for the export orders arrived just when the supplier's invoices became due for payment. A small bank overdraft enabled him to cover his additional capital needs for the increased wages bills, etc.

5. The Expenses

Weekly total

The manufacturers' office expenses for export only came to £400 yearly, made up as follows:

£

One manager on export business eight hours per week
One typist, two days a week
Postage, telephone, cables ...
Stationery, photographs ...
Sundries ...

No expenses were incurred for (a) catalogues or printed matter; (b) gratis samples or (c) agents.

When he entered the export trade, the manufacturer had 18 employees. Later the figure increased to 29, together with 18 outdoor workers for whom accommodation could not be found in the factory.

The manufacturer's system of outdoor workers, employed only as needed week by week, did not result in any overheads for the export orders in the factory.

To sum up, one might say that the following features of the scheme helped to make it a success:

- (a) No extra export expenses; therefore cheap costing and competitive prices.
- (b) The special attention given (from the outset) to the individual needs of each overseas market as far as these could be predicted.
- (c) Good letters (the only link between manufacturer and agent), prompt attention and regular follow-ups,
- (d) The fact that the manufacturer showed increasing tenacity, in pursuing his contacts, even though the first year had not brought much business.
 - (e) Good connections.

How the Efficient Office Can Boost Industrial Output

By RICHARD LAWRENCE

THE greatest single factor in American industrial supremacy -according to a Management Accounting Team which visited the States recently-is the effectiveness of management at all levels. This effectiveness rests not on any technical superiority, but on the thorough application of techniques which are as well known in Britain as they are in the United States. In particular, offices are organized to give much more information more rapidly and more cheaply than is normal in this country. In turn this involves a greater capital expenditure on attractive offices and on office machinery of all types.

In their report* the team say that accounting and costing informa-

AIDS TO OFFICE

Fully use all types of machinery

Instal proper lighting, ventilation.

Provide good desks and seating.

Deaden noise by constructional means.

Study colour in interior decoration.

Be spacious in layout.

Plan large, not many small offices.

Raise standard of discipline. The office can play a vital part in raising industrial production. Management needs facts and figures—quickly, accurately, cheaply. Only thus can production be planned and controlled. To give this service, the office must be efficient—with the right staff, the right machinery and equipment, the right working conditions. An interesting new report summarised here tells how American management, in small as well as large tirms, gets—and uses—statistical information.

tion is used for two purposes—planning and control. Plans are translated into budgets and budgets broken down into targets for individual managers and foremen. Practically every company use some form of budgeting, although it is often called by another name.

Some form of standard costs is more often than not in use, and historical costing was seldom found. Rather than use elaborate flexible budgets, it is the practice to set long-term budgets for cost ascertainment and prices, and during the lifetime of this budget to set many short-term budgets which are used for control periods.

A wide variety of methods of accounting and costing was seen. There is in general no distinction made between financial records and cost records, but accounting is treated as an integral whole.

The methods of costing can be grouped into four main types:

 Historical costs used for current control and for product costing;

(2) Historical costs used for current control, with product costs based on standard costs;

(3) Standard costs used for the control of current operations, and the same standards used to calculate products costs;

 Obtainable from the Anglo-American Council on Productivity, 21 Tothill Street, London, S.W.1. (Price 2-). (4) Standard costs used to control current operations based on short-term budgets, and longterm budgets used to calculate product costs. Marginal costing appears to be little used.

The fixing of budgets is very closely allied to detailed forecasting based on market research. As soon as the sales forecast is complete, it is passed over to the controller's department which builds up financial budgets and forecasts, balance sheets and profit and loss accounts, and links these with production budgets. Time study and job evaluation are widely used in preparing budgets.

The results achieved by each manager and foreman are frequently compared with the target set, and all levels of management, from top management to charge-hands, are familiar with figures and show a marked ability to absorb information in this form.

Paperwork is kept to a minimum. Long elaborate reports are avoided, and much of the more valuable information passes in personal contact between the controller's department and all levels of management. Routine reports are restricted, and more and more time is spent by the controller and his staff in the preparation of special non-recurring reports on subjects

which are occupying the attention of management.

All control figures are produced for the sake of guiding policy and action, and never just as a matter of interest. Every regular report is meant to be used, and, if not used, is scrapped.

The gap between management and accountancy is still apparent, but both sides are aware of it, and the efforts made to bridge it have succeeded far beyond the normal achievement in this country.

The promptness with which reports were prepared impressed the team enormously. The daily statement, for instance, was found to be presented without exception on the following morning. Statements of figures are usually unaccompanied by written reports-again on the ground of speed. They are often handed out personally by the controller or a senior member of his staff with a verbal explanation of the figures, and the controller is prepared to answer questions on the spot. Formal conferences were rare.

Highly-trained Staff

Office staff generally include a higher proportion of first-rate highly-trained staff, many of them the product of the schools of business in American universities. These men act as immediate subordinates to the controller, and are expected to know all the work of his department and nearly as much as him about the rest of the business. The rest of the office is made up of semi-skilled clerks, capable of doing several jobs and willing to change at a moment's notice from one to the other. This flexibility is necessary to achieve a smooth flow of work with rapid delivery of results when wanted. There are very few highly-skilled or unskilled clerks.

All types of office machinery are used extensively, and though the proportion of larger firms using major accounting machines is no greater in America than in Britain, smaller firms in the United States make greater use of major office machinery.

FIVE POINTS FOR MANAGEMENT

- I. Use budgeting and forecasting, based on accounting and costing data.
- Set standards of performance and of accounting control techniques to decentralize responsibility.
- 3. Consult industrial accountants in early stages of formulating policy.
- 4. Publish fullest information in annual reports.
- 5. Advocate schools of business training.

(Condensed from Accounting Team's recommendations)

Auxiliary machines, such as calculators, typewriters, adding machines, etc., are regarded as mechanical aids to be used as and when required. In many offices almost every clerk and shorthand-typist is provided with a calculator, and many clerks are provided with a typewriter. Far more machinery may be provided than is actually necessary, but since the wages cost of clerical labour is so high-there is a legally enforceable minimum wage of \$30 a week*-the expenditure is considered worth while. One spokesman suggested that an investment in machinery of roughly £250 a clerk was justified.

The standard of office discipline compares with that of a production shop, and frequent changes in procedure are accepted in the same way as technical improvements are accepted in the factory. The work of internal auditors, which covers not only the checking of the books but also systems and procedure work and even office discipline, is regarded as the equivalent of that of the methods and time-study engineer.

Most American companies have large general offices instead of many small ones, with supervisors located either in the general office or in glass partitions attached to it. Advantages claimed are easy visibility, reduction of time in finding and contacting staff, ease in planning and controlling the flow of work and simple communication

between different sections. Reorganization is also easier.

Space and layout of the office are carefully planned, and good physical conditions are regarded as essential to efficiency. Lighting equipment is usually of a high standard, with fluorescent lighting in common use. The light flux at desk level is even and of a high candle-power; there is consequently little need for additional desk lighting.

Ventilation is normally by air conditioning or by large electric fans; Venetian blinds are widely used to cut out sun rays while permitting the flow of air.

Special attention is paid to cutting out noise (an important factor with large offices) by means of acoustic tiles and cork and rubber flooring.

Desk and seating accommodation is usually of uniform style, often blending with interior decoration; the effect of colour on working conditions and output is a special study.

Good working space on desks is fairly general and machine operators have adequate working space beside their machines. Some typing desks house the typewriter where the left-hand drawers of the desk would normally be, the typewriter coming into position when required on to a pedestal at right angles to the desk. The typist swings round on her swivel chair for typing and still has the whole of the desk at her right hand for papers or an adding or calculating machine.

^{*}Equivalent, at the present rate of exchange, to £10 14s. 3d.

Costing Helps a Process Industry

In his second article on the use of standard costs as a tool of management in a process industry, the author shows how to-

- By JOHN MANOLESCUE
- Estimate the standard costs of unit processes.
- Use these standard costs to check labour expenses.
- Calculate an expense budget for each department; and
- Compare budgeted and actual expenses so as rapidly to identify inefficiencies in operation.

N costing procedure in the expense ledger, each process account accumulates on the debit side from the various posting summaries the actual expenses incurred; on the credit side it will collect recoveries, i.e., labour and expenses absorbed in production. The differences between actual expenditure on labour and overheads and the amounts thus recovered will be taken to the Variance Summary Account which classifies all deviations from standard into causes and departments.

The most important aspect of expense costing is the setting of the standards. A practical example will help to follow it through. Assume that management wishes to sell 100,000 barrels of beer in a particular year; and that opening stocks are fairly stationary. Past experience shows that it takes approximately one hour to brew and fill one barrel of beer, so that to produce and fill 100,000 barrels, 100,000 hours will be required. One man working five days a week (42 hrs.) for 50 weeks (two weeks' holiday and Bank holidays) will account for 2,100 hrs., less a five per cent, contingency allowance, say 100 hrs. If one man works 2,000 hrs. a year, then 50 men work 100,000 hrs. But filling the barrel takes five minutes, and a quarter of the year's beer production is to be bottled. Therefore, 25,000 x 1/12=2,083 hrs. must be deducted from the 100,000 hrs. required for the production of 100,000 barrels, after allowing for the transfer of 25,000 harrels of bulk beer to the bottling department, Assuming that it takes .2 hrs. to wash, fill, cork and label one dozen bottles of beer, and that one barrel contains the equivalent of 12.5 cases at four dozen bottles of beer, then

25,000 barrels x 12.5 x 4 x 2 represents the production time of the bottling department, i.e., 250,000 hrs. Adopting the same basis of calculation, i.c., 10,000 hrs. per man, 125 workers will have to be employed in the bottling depart-

It is now possible to build the labour budget. The wages of process workers may range from 65/to 100/- a week A weighted average pay must therefore be found.

Brewing Department (42 hrs. week)-Brewing

and e		nilling								
	10	men	at	65	-	per	week	=	650	1
	1.5	**		×81		**	24	=	1,200	
	20	**	**	85		**			1,700	
	53	**	**	100	-	24	8.6	=	500	*,
Total		earn	ing	s pe	er	week		=	1,050	

Total

process labour Weighted average pay per man: \$1s. per week or 1.687s, per hour. Total labour cost: \$7.917 hrs. x 1.687s.=£8,261.

Bottling Department (42 hrs. week)—Bottle-washing, filling, cork and labels. 50 women at 55 - per week=2,750 -

125	earnings	1	ier.	W	eek		= 9,100/-,
	men	**	1183		**	**	= 4,000 -
25	**	**	60		**	**	= 1,500/-, = 850/-,

brucess
Labour
Weighted average pay per man;
72.8s. per week or 1.517s, per hour.
Total labour cost:
250,000 hrs. x 1.517s.=£18,963.

Assume that during March, 1950, 5,000 barrels were produced as against a budget estimate of 5/52 x 100,000=9,615 barrels (March being a five-weekly period). According to the wages returns of the brewing department 4,500 hours were factually worked, and an amount of £600 was paid out, as

budget

against a labour

5/52 x 8,261=£794.

The information could then be tabulated as follows:

Labour Variance Analysis

Browing Department	**	
Budget Hours	Hrs. 9.615	
Standard Working Hours allowed for the month's production Hours actually worked as per Wages Returns	5,000	
Budget amount for Wages Actual payroll	£ 794 600	
Total Labour Variance	± 194	(A)
Standard working hours allowed: 5,000 hrs. x 1,687s	422 380	
Efficiency (favourable)	+42	(B)
Actual payroll Actual working hours at standard cost: 4,500 hrs. x 1.6878	600 380	
Pay rate changes from budgeted ratio (unfavourable)		(C)
Budget amount for wages: 9,615 hrs. x 1,687s Actual production wages cleated	794	
into cost as per Brewery Costs Sheets: 5,000 hrs. x 1.687s. (Re- covered)		
Volume Variance: Apparent sav- ing on quantity under-produced	+372	(D)
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	+194	

In the above analysis the total labour variance (A) is split into three components according to the causes producing the difference between the actual payroll and the amount budgeted for. Labour efficiency variance (B) is the difbetween the standard ference working hours for a given output and the actual working hours, both at the standard labour rate. In this case it represents a gain, due to achieving more than standard output per hour. Wage rates variance (C) is the difference between the payroll and the actual working hours at the standard rate, and represents in this case a loss due to pay rates being in excess of standard, or to employing men on vouths' or women's jobs.

In the above illustration the two main processes were concentrated on, but brewery operations may be analysed into various subprocesses, each with a separate labour and expense budget. Thus, one may have the following labour and expense budgets: malting, brewing, cask-filling, ageing, bottle-washing, bottle-filling, corking, labelling, etc.

The departmental expense budgets, built up from past records, are of course based upon the budgeted production. The budget is then analysed by expense classification into (a) Fixed expenses; (b) Variable expenses to facilitate comparisons with actual results.

Semi-variable expenses may be fitted into (a) or (b) provided they constitute a small proportion of the overall expenditure.

The expense budget for each process department will include (1) overheads which can be allocated directly and (2) a proportion of

general production overheads, in the nature of a transfer from service departments.

The first budget to be compiled

will, therefore, be a Service budget divided into (a) Building service; rent, rates, repairs, wages of maintenance labourers, etc. (b) General services: works salaries and miscellaneous general overheads; (c) Boiler service: stokers' wages, water rates, power and fuel, etc.

The latter represents an auxiliary service to the bottling process (mainly for bottlewashing); it is therefore transferred in its entirety to the bottling department.

From columns (4) and (5) of Fig. 1 it will be seen that the total service overheads (excluding boiler) are apportioned to the two processes on the bases which are most suitable for the particular type of expense. Assuming production to be uniform during the year, the figures in Figure 1 will then be broken down into 12 monthly periods (two four-weekly and one five-weekly period per quarter).

Each month a replica of Figure 1 will be prepared containing details of actual overheads, which may then be compared with their budget counterparts.

The invoices for the previous year are scrutinized and, after duly adjusting variable and semi-variable overheads to the budgeted level of output (100,000 barrels of beer, and 1,250,000 dozen bottles of beer) the results are tabulated in the following manner:

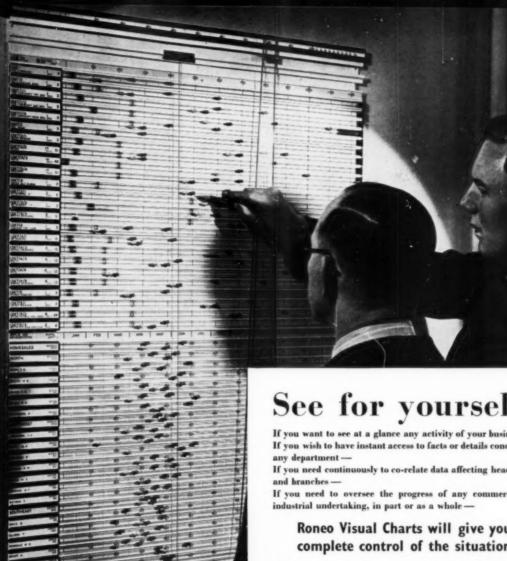
BUDGET OF PROCESS DEPARTMENTS for year ended 31/12/1950.

Expense	B	Dept.		
		2	£	
Supervision	***	700	700	F
Indirect Labour a Holiday Pay	200	500	800	V
Overtime and Sub-		1000		Λ.
	***	20	200	v.
Consumable Store		150	200	110
Power and Fuel	516	110	50	51.0
Repairs to Machine			1(10)	F
Depreciation	2.64	51	50	21.0
General Works Ex	15.	3.6	734.6	24
	1	1,871	2,100	
Add Service Transf (Figure 1)	ters	1,11	2,476	55%, F 45%, V
Total Overhead penses		£2,988	£4,576	
4 weekly period=4	1/52	£230	£352	
5 weekly period=5	52	£287	£440	
2	one	-1.00	0 0 - 1	52=2,516
		=1,54		140 = 1.760
4 X	200	=1,14	4 7 4	1,110
		£2,955		€4,576

Semi-variables are included with variables; they represent approx, 1 10 of the total.

Then then gives us the necessary information to obtain (1) hourly costing rates; (2) costing rates per unit of output,

BUDGET OF SERVICE DEPARTMENTS AND SERVICE TRANSFERS for the year ending 31/12/1950. FIGURE 1 APPORTIONMENTS (1) (2) (3) (4) (6) (5) Total Brewing Dept. Bottling Dept. Basis of Apportionment Ruilding General Boiler £ £ £ £ £ 3 No. of employees (50:125) Works Salaries (F) 1,000 1.000 286 714 Indirect labour and holiday pay (V). 800 300 500 400 250 Floor space 250 Consumable stores (V) 25 15 10 25 Technical estimate Fuel and Power (V) 50 25 25 250 Floor space en Technical estimate Repairs and maintenance (F) 80 280 280 40 Floor space Rent, rates, taxes and insurance (F) 50 Depreciation (F) 50 25 25 120 Floorspace 120 General working expenses (V) 35 125 160 46 114 63 Process hours ... 1,140 1.625 2.765 1.117* 2.476 828 Total service expenses Total transfers to processes 2.765 828 Transfers to Transfers to Brewing Dept. NOTE: Fixed Service Expenses Bottling Dept. Variable .. 1,623 45 4-weekly period = 4-weekly period = £190. £3.593* 100



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Total overheads for the brewing department are £2,988 which must be spread over an anticipated production of 97,197 hrs. Therefore one hour of production incurs overheads of .615s. Similarly the bottling department's expenditure is £4,576, which spread over 250,000 hours gives a costing rate of .342s. per hour. The hourly rates for labour were obtained earlier, and must be included in the calculation of the total standard cost rate as follows:

ment. In our case 5,000 x 100 and divided by 9,615 equals 52 per cent.

It may be further assumed that the actual expenses standing to the debit of the brewing department in the Expense Ledger (after making the necessary Service transfer) is £200 as against a budget estimate of £287.

Now £287 is not a representative budget figure, for it was ascertained on the assumption that the level of activity for the month would be 100 per cent., namely

I. EXPENSE VARIANCE SU Brewing Department	
Budget hours	9.615
Budget hours Standard working hours	5,000
Activity	52"
Budget hours	0.616
Budget hours Actual working hours	4.500
Standard capacity employed	46.8
	£
Budget at standard capacity	287
Actual overheads	200
Total Expense Variance	+87 (A)
Actual overheads Cleared into cost (5,000 hrs.	200
Gleared into cost (5,000 hrs.	
х 0.615в	154
†Expense Recovery Variance	-46 (B)
*Budget at capacity employed (for actual volume of pro- duction)	228
Cleared into cost	154
Volume Variance	_74 (C)
*Budget at capacity employed	228
Actual Overheads	200
Controllable Variance	
	, ()
Budget at standard capacity	
(9,615 hrs. x 0.615s.)	287
Cleared into cost (5,000 hrs.	
x 0.615s.)	154
Volume Recovery Variance	+133 (E)
$\mathbf{A} = (\mathbf{B} + \mathbf{C} + \mathbf{D} + \mathbf{E})$	
The Volume Recovery Variance	e shows a
gain as money was saved or reduced output compared wi †The Expense Recovery Varian	wing to a th Budget.
loss because more was sper	
covered from the actual	

production *See Schedule 11.

trollable variance a gain of 28,

which however on closer examina-

tion (see II Expense Variance

Analysis) reveals the existence of

several deficiencies, particularly of

indirect labour. This might then

be enquired into.

STANDARD COST RATES PER HOUR Standard cost of Labour and Overheads Standard Processlahour Process Overheads (budget) AmountRate Rate 1,687 8. 0.615 8,261 Brewing Dept. 11.249 Bottling Dept. 250,000 18,963 4,576 0.342 Total 347,197 27.224 7,564 34,788

The departmental standard cost of labour and overheads per hour is converted into a rate per unit so that recoveries may be related to actual output during the year.

It is known that it takes one standard hour to fill one barrel of beer, and 12 standard minutes to wash, fill, cork and label one dozen bottles. The hourly rate of the brewing department wi', therefore equal the rate per unit (barrel), but the hourly rate of the bottling department (1.859s, or £.0929) must be divided by five (12 minutes =1/5 hr.) to obtain the standard cost of labour and overheads per dozen bottles, i.e., £.0186.

Having built the budgets and having found the cost rates, next one may examine the procedure of comparing the actual costs for a given month with the departmental budgets, referring back to the Labour Variance Analysis March: (1) Actual production: 5,000 barrels; (2) Budget estimate: 9,615 barrels; (3) Budget standard hours: 9,615; (4) Standard hours of actual production: 5,000; (5) Actual hours of actual production: 4,500.

The volume of work performed expressed in standard hours can be measured as a percentage of the budgeted volume. This percentage is called the activity of the depart9.615 barrels of beer. In effect, 5,000 barrels were produced by the brewery, an activity of 52 per cent. A lower activity reflects lower costs, and therefore a revised budget figure must be prepared as standard to the brewery manager, which is based on the volume of output achieved by him during the period. The conversion formulae for each type of expense (fixed or variable) are given below:

Enlisting the aid of (a) and (b) the revised budget figure for the month of March, Brewery department would be £228, and the con-

(a) Fixed Expenses: CYA

Where $\Lambda = \text{original budget estimate}$, B = capacity and C = activity. (h) Varying Expenses: Original budget x Standard hours allowed

Standard budget hours Capacity = Actual working hours $-x 100 = 4,500 \times 100 = 46.8\%$

Standard capacity (hrs.) Activity = Standard hours allowed x 100 = 5,000 x 100 Standard budget hours

II. EXPENSE VAR			DEPART	MENT
Supervision (F)	Budget 100°, activity 100°, capacity 68	52', activity 46.8', capacity 72	Actual 68	Contro lable Variance
Ind. labour and Holiday pay (V) Overtime (V)	48	25	40	-15
Consum, stores (V) Power and fuel (V)	14 14	7 7	10	-3 -3 -3
Repairs to mach. (V) Depreciation (F)	10 10 5	6 20	19	4
General works exp. (V) Service Transfers 55% (F) Ditto 45% (V)	59 48	3 62 25	40	3 22
	287	228	200	18



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The machine's ability to provide a variety of type sizes and styles is made possible by changeable metal segments faced with 90 characters. These segments allow the typist to change from a large bold headline type to a small compact

text type in a matter of seconds.

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-(Enquiry Ref. No. 01/3.)

Tape Recorder

PORTABILITY and simplicity of operation are two prominent features of the new *Tape*-

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An indicator control on top of the cartridge works in conjunction with a card which shows the position and length of letters and recordings. This makes it simple to locate any specific letter or piece of dictation. There are spaces on the card for writing in brief details of what has been recorded—a visual index of each reel of tape.

The control system is simple.

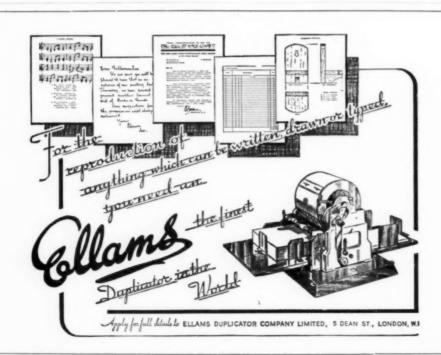


The Tape-Riter's quickly detachable "cartridge" which contains the reel of tape.

On the left hand side of the machine is a combined on/off and volume control wheel. On the right-hand side are the remainder of the controls, which are operated in a similar fashion to a motor car gear lever. By using the lever and "changing gear" the machine records, plays back, speeds forward to any point at 15 times the regular pace, or rewinds equally fast. The fast rewind takes only two minutes and enables any position



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on the tape to be located quickly by watching the indicator control, The detachable cartridge and simple control system enable blind persons to operate the machine after only a few minutes' instruction



This comfortably sprung model 90 executive's chair is available in three versions.

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Besides normal dictating requirements, the machine can be used for recording interviews, conferences and for sales training and other purposes.

-(Enquiry Ref. No. 01/4.)

For Comfort

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-(Enquiry Ref. No. 01/2.)

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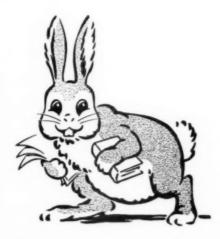
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-(Enquiry Ref. No. 01/5.)

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-(Enquiry Ref. No. 01/1.)

mal duplicating paper, even where double-sided work is being done. This feature enables much time to be saved. The special inking system allows twice the number of copies per pound of ink to be obtained and the *Policy Model* also features a clean colour change in 25 seconds, which is very important from the operator's point of view.

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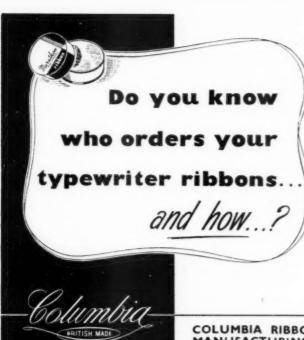
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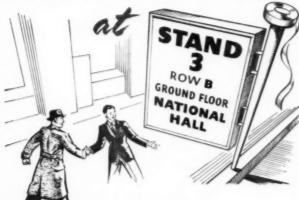


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This Year's Exhibition Plans

SCOTTISH businessmen will have an opportunity of seeing the latest office equipment early this year. A Scottish Business Equipment and Management Exhibition, organized by the O.A.T.A., is to be held at the McLellan Galleries, Glasgow, from 20th to 23rd February. It will be organised on similar lines to the recent Leicester exhibition.

The Association will also be taking its usual part in organizing the office equipment section at the B, LF, at Olympia, London, which will be slightly larger than last year.

The 1951 Business Efficiency Exhibition, which will also be held at Olympia from the 6th to 16th of June, will be easily the largest of its kind ever staged and will cover over 175,000 sq. ft.

A special feature of the exhibition will be a Hall of Progress, contributed to by all members of the Office Appliance Trades Association.

THE office industry invaded a relatively new field in November when a number of firms exhibited for the first time at the Public Works and Municipal Services Exhibition, Olympia. Visitors were able to see various products including punched card equipment, filing and book-keeping systems, etc.

The general reaction from most of the exhibitors was that the exhibition had produced a satisfactory number of enquiries, although final judgement would have to be reserved until some time after the exhibition closed.

Moores Modern Methods Ltd., apart from showing their usual range of equipment and stationery, had an addition in the shape of forms for civil defence records. They had been so busy on the stand that extra staff were necessary.

Duplicators were represented by the products of Gestetner Ltd., Roneo Ltd., and Ellams Duplicator Co., Ltd. Intercommunication equipment was shown by Communications Systems Ltd. and Ardente Acoustic Laboratories Ltd.

The British Tabulating Machine Co., Ltd. and Powers Samas Accounting Machines (Sales) Ltd. both had stands, and other firms included C. W. Cave & Co., Ltd., George Anson & Co., Ltd., International Coin Counting Machine Co., Ltd and Osda Ltd.

THE biggest office equipment exhibition of its kind to be held in the Midlands was opened at Leicester in November by Lord



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Cromwell, D.S.O., M.C., J.P., Lord Lieutenant of Leicestershire. Forty-five exhibitors displayed their latest products and the stands covered an area of 12,000 sq. ft.

In our photograph Lord Cromwell is seen watching a demonstration of a postal franking machine on the stand of Ronco-Neopost Ltd. On the left is Mr. W. B. Woods, President of the O.A.T.A., and a director of The National Cash Register Co., Ltd.

Most manufacturers were optimistic about the success of the exhibition and at least one firm—Block & Anderson Ltd.—got away to a quick start by selling a Bandamail 200 hand-operated letter opening machine, within a few minutes of the exhibition being opened

WHEN Universal Postal Frankers, Ltd. occupied their present works at Edmonton, London, it was anticipated that they would be large enough to cater for production requirements for some



Lord Cromwell at the Leicester Exhibition.

time. The demand for Frankopost products (from both home and overseas markets) has, however, necessitated further expansion. A new three-storey building, adjacent to the main works, is under construction, and when completed should double the space available and give adequate production capacity.

The firm hope to occupy a portion of the building within the next few months, but the major benefits from the extension will not be obtained until the middle of 1951.

MR. J. A. Cumming, honorary marketing director of the O.A.T.A., was elected president of the International Union of Office Appliance Trades Associations in succession to Mr. W. G. Gledhill, Honorary Treasurer of the British Association, at the Union's annual meeting at the Hotel Continental, Paris recently.

Mr. Cumming was president of the O.A.T.A in 1945/46.

THE Council of Industrial
Design have selected the model
DL22 intercommunication instrument manufactured by Dictograph
Telephones Ltd. for exhibition at
the Festival of Britain. It will
be featured in the Power and
Production Section.

The model DL22 is a loudspeaking master station which can be connected to 22 other points, and is finished in light oak. It was designed by Dietograph's own staff, and went into production at the beginning of 1950.



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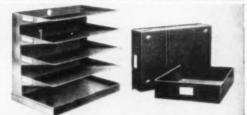
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Costs Lowered, Output Raised By Time and Motion Study

By A. G. THOMSON

This article describes how a firm successfully introduced an incentive scheme based on scientific time and motion study, and virtually eliminated carrying of work by the installation of trolleys, conveyors and other handling equipment. Although designed primarily for a laundry and dyeworks, the scheme contains many valuable lessons which can be applied generally.

SINCE the war two main difficulties have confronted the laundry industry in its endeavours to increase output and give customers quicker service. First, there has been a high labour turnover among female operatives. This was particularly noticeable in the early days of peace, when operatives," many of them newly released from munitions work, tended to feel unsett'ed about the future. Second, increased mechanization has been restricted by the fact that the necessary plant has not been readily available.

Therefore the industry has been obliged to look round for a different means of obtaining a larger and more rapid throughput. In this connection the Institution of

British Launderers has played a valuable part by actively investigating the question of incentive schemes, and, to assist its more progressive members, by setting up a Production Department staffed with fully qualified time and motion engineers.

One firm which has taken advantage of the Institution's service is the Carlton Laundry & Dyeworks Ltd., of Nottingham, where, to speed up throughput and increase production, an incentive scheme based on scientific time and motion study has been introduced successfully.

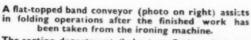
Although the time factor is of major importance in laundry work, Carlton's post-war difficulties were such that they could only give customers a fortnightly service as against a pre-war weekly service; they were also faced with a much greater demand than they could supply.

One reason why incentives are particularly applicable to the laundry industry is that wages are responsible for a very high proportion of the total production cost, the figure varying, broadly, from 50 to 55 per cent. Thus, one of the foremost requirements was to reduce the proportion of labour costs, not by cutting operatives' wages, but by getting greater production from the same number of workers. It was considered by Carlton that this could most effectively be achieved by a time and motion scheme.

The work was started in June, 1947, the scheme being planned gradually through by the company in co-operation with the production department of the Institution, who sent some of their staff to the works. Invaluable co-operation was also received from the company's associate, A. L. Marshall (Carlton) Ltd., who occupy an adjoining factory. This firm design and manufacture mechanical handling equipment for most industries. With their intimate knowledge of handling in the laundry industry, their engineers were able to design and construct special equipment on which the time and motion studies could be based.

SIX SPECIFIC GAINS

- 1. UP by 110%—number of actual jobs handled in the plant
- 2. UP by 60 -number of customers serviced.
- 3. UP by 30%—earnings of individual operatives without any increase in basic rates of pay.
- 4. UP (DOUBLED)—weight of work processed per week.
- 5. DOWN-labour turnover.
- CUT—from a fortnight to a week—laundry collection and delivery service.



The sorting department (below) at Carlton Laundry showing operators checking work and passing it on to a two-tier conveyor.



of work through the laundry will enable the considerations governing the development and application of an incentive scheme to be more readily understood.

The bulk of the work is collected from customers in the company's own vans and taken direct to the plant, where it is processed in lots of a controlled weight. Each lot flows entirely separately through the sequence of processes, being split up into eight classifications according to the type of article, nature of fabric, and nature of soiling. Each classification has a separate washing process, which was originally developed by the industry's national Research Association.

The first operation is to check the work received against customers' laundry lists, an interesting point being that up to 40 per cent. of the customers' lists require rectification. Each customer has an individual laundry mark, woven tabs with the correct mark being attached to all sheets, garments, etc. by electric tabbing machines. Work passing from the sorters for classification and from the sorters to be marked is transported by a

specially designed Marshall conveyor. After classification it is loaded into special trolleys, weighed, and transported to the wash-room.

Washing is done in rotary washers of varying sizes, depending on the classifications being handled,

After washing has been completed the work is dried in hydro-extractors, which leave it ready for the finishing processes. It is then arranged in special trolleys so designed that each article can be laid in its correct position for feeding into the ironing machine. The main purpose of these trolleys is to cut out an appreciable amount of handling at this point, their design being such that they can be run under the feed-bands of the ironing

machine with the articles so arranged that the feeders simply pick them up and load them straight into the machine.

Below the packing table is a band

conveyor which receives the com-

pleted parcels and carries them away, via an elevator, to the des-

patch department.

Running the full length of this machine is a special conveyor with an automatic stop, its purpose being to cut out manual handling of work which has to be passed through the ironing machine a second time. On the delivery side of the machine is a flat-top conveyor, again of special design, on which part of the folding operations can be undertaken while the work is moving along.

As the work is folded, it is sorted on to special sub-racks according to the digits on the laundry marks. It is then conveyed by light trolleys to the racking department, where each article is matched up with the marks on the customers' lists relating to the particular lot in question. The racks into which the articles are sorted have been designed to rotate through 180 degrees. Thus work sorted by the racking department can be swung round to face the packers on the other side. Packing consists of making up each customer's articles into parcels and wrapping them, these operations being done on a specially designed conveyor packing table, which conveys the finished parcels directly to the dispatch department.

So far motion study has been applied mainly on the handling side with the object of cutting out unnecessary walking and, in particular, carrying of work from one process to another. The installation of the trolleys, conveyors and other handling equipment, all specially designed by A. L. Marshall (Carlton) Ltd., has virtually eliminated the carrying of work at every point.

Once the special handling equipment had been installed, job specifications were worked out in minute detail for every operation and the sequence of each operation was laid down. The initial scheme took about seven months to introduce. A start was made with the sorting department, where the first operations take place, and this department was then used to sell the scheme to the rest of the factory.

Won Support of Staff

Since the laundry industry has a domestic background, it was realised that few of the staff were likely to have had previous experience of incentives based on time and motion study. Mr. W. P. Bowden, manager of the Carlton Laundry & Dyeworks Ltd., therefore considered that his most important duty was to gain the support of the staff.

A meeting of top management was held at which the scheme was thoroughly explained. This was followed by a meeting of departmental chargehands, and finally all the company's employees were

called to a meeting at which the scheme was very fully presented.

The system is fairly straightforward. By splitting each job into its elements and establishing a normal time for each element, the total standard times for the various jobs have been determined. The value finally arrived at for each job issued is never altered unless the operation is changed.

Bigger Pay Packets

The normal performance established for each particular operation is termed a 60, this designation representing the standard time laid down for a specific output. The incentive given is in direct proportion to the results achieved. If an operative does an 80 she gets a third more than her basic wages, while a 90 would increase her pay packet by a half.

In order to ensure their confidence, operatives keep their own daily work sheets, from which valuable statistics are compiled by a new department established for this purpose.

Operatives in the sorting department took to the scheme so readily that the management soon began to be pressed by workers in other sections, who were impatient to have the advantages of incentives in their own departments. From the management's point of view a certain amount of additional paper work is involved, but the scheme has been fully justified by the results achieved.

The first—and perhaps the most important—gain is that the frequency of service to customers has been reduced from a fortnight to regular weekly collections and deliveries. Although the company is now delivering the finished work in half the time, they still have sufficient throughput to maintain the full normal working week.

The number of customers serviced has increased by about 60 per cent., while the number of actual jobs handled through the plant has risen by 110 per cent. The weight of work processed per week has doubled, but the number

of operatives employed has remained approximately the same. The actual earnings of individual operatives have increased by 30 per cent.

Yet another important benefit is the information made available by analysis of the daily records of each operative's work. From these work sheets are compiled statistical records of the actual numbers of articles processed each day, together with details of any time lost during the day from any cause whatever. These figures are built up again into departmental totals, showing the position of each section of the works.

By a logical extension of this procedure, master copies for the entire factory are evolved each week, on which are recorded both standard cost and actual cost. The excess cost is broken down into waiting for work, waiting for instructions, machine breakdowns, power cuts, waiting for first aid, etc. All this information is valuable to the management from many points of view. It facilitates production planning and is also very useful for both costing and quoting.

Scheme's Advantages

On balance the scheme is considered to have proved itself very well worth while. It has improved service to customers, as well as throughput of plant and machine utilization, and has substantially increased the earnings of operatives without any addition to the basic rates of pay. At the same time, the scheme has appreciably reduced labour turnover, and this in turn has resulted in a general increase in the experience and skill of operators.

As an essential part of the initial scheme, members of the company's own staff have been trained in time and motion work. The company was thus in a position, without further assistance, to apply a scheme, based on exactly the same principles, to its dry cleaning division, where the requirements are very similar.



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Survey of Modern INDUSTRIAL EQUIPMENT

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The machine will bore holes from lin. to 6in. in diameter, the maximum length of hole to be bored depending on the diameter of the component, Incorporating a spindle



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The standard bridge will accommodate up to four spindles, each guaranteed to run true within .0001in. total indicator readings, and means of adjustment down to .0001in, is incorporated. Boring action is arrested at the end of the required operation by a magnetic brake. For facing, an adjustable dead stop is available, —(Enquiry Ref. No. J.51/4.)

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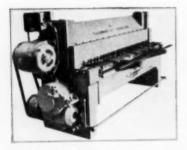
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attachment, self-adjusting holddowns, and easily operated front, side and back gauges.

The drive of the machine is vecbelt from motor to flywheel and thence through a worm and wheel reduction unit to the eccentric shaft. It is controlled by a clutch of the non-repeat multi-jaw type which can be set for either single stroke or continuous stroke operation. Clutch control is actuated by a treadle which can be operated from the most convenient position, as it runs the full length of the machine.

Gauges are adjustable, and the front one can be set parallel to the cutting blades or at an angle to 5ft. fluorescent lighting troughs,

them. Extension arms are furnished, carrying both the sheet and the front gauge beyond the width of the table. A side gauge is fitted to the blade table, to be used when cutting at right-angles to the gauging angle of the sheet.

The shear blades themselves are of ample section, ground with four cutting edges and are suitable for cutting stainless steel up to 16 S.W.G. The machine also incorporates safety devices, guarding against danger to the operator and harm to the machine itself.

-(Enquiry Ref. No J.51/6.)

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- (Enquiry Ref. No. J.51/5.)

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Lorry Load Lifter

LORRY loading by the usual straight-lift or inclined-plane method can be a hazardous and highly inefficient way of using labour. With this in mind, designers of the Hydrum hand or power-operated mobile load lifter, offer a piece of equipment which will lift seven cwt, loads from three inches to between three feet and four feet six inches in five seconds.

Featuring a "no tilt" design, this LPP model of the Hydrum lifter keens all loads perfectly level throughout the lifting operation. The equipment is fitted with a rubber-tyred, retractable tricycle undercarriage, hydraulically operated, which makes it easily mobile, It can be operated by a woman if necessary and is obtainable either powered by petrol or electricity.



BUSINESS

The hand-operated model, which is also available, takes 40 seconds to do the work the power type accom-

plishes in five.

Frame of the lifter is steel fabricated and actual lifting is done by way of an arranged system of parallel-link-motion arms. Raising and lowering of the platform is controlled by a foot control. For loads such as barrels, drums, casks, etc., that can be tilted through 90 degrees, another piece of equipment is also available.

-(Enquiry Ref. No. J 51/1.)

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age truck meets a widespread demand.

The model is powered by a standard 3-h.p. Villiers 250 cc. four stroke petrol engine with Albion three-speed and reverse gear box. This unit, together with all controls, turns through a full circle on a ball bearing turntable plate, and, with chain transmission, drive wheel assembly, built-in girling hand brake and 16in, by 4in, heavy duty wheel, forms the steering apparatus. An hydraulic pump is connected to twin rams under the main olat form, giving a lift of 3in., from a closed height of 9in

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-(Enquiry Ref. No. J.51/2.)

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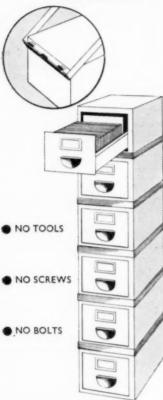
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non-technical personnel. It will test, to approval specifications, the vast majority of general purpose valves.

It is also of considerable value to service engineers in diagnosing faults in complicated electronic equipment Results of a test are indicated visually by means of a cathode ray tube and coloured scale. If the valve is within the specified limits, the spot on the screen is deflected to the green part of the scale.

Similarly, a faulty valve shows red, and one needing early replacement, yellow, Selection of the correct test voltage is performed by inserting a punched Bakelite Card in a multiple gate switch.

This card is selected by means of a list giving valve types and the reference numbers of corresponding cards. Once the instrument is set up, there are no adjustments to make, and it is virtually impossible to damage the instrument or valves under test. Easily transported, compact and solidly constructed, the instrument will give highly accurate tests including the following: filament or heater continuity; electrode insulation with H.T. not applied; heater-cathode insulation; electrode insulation with H.T. applied; grid current; emission, and electrode open circuit.

-(Enquiry Ref. No. J.51/7.)

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The heating element is so constructed that it localizes the heat around the copper bit, thus eliminating wasted heat areas which, in turn, assures considerable economy in current consumption. The same feature also does away with excessive temperature rise, prolonging heating element life and minimizing oxydization of the copper bits.

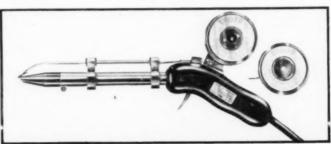
Comfortable control is obtained by the off-straight hand grip. Models are now available in a variety of voltages, for both heavy duty and fine work.

-(Enquiry Ref. No. J.51/8.)

New Heat Meter

WITH the new self contained Heat Meter it is now possible to measure the heat units supplied by hot water systems, an operation which could otherwise only be performed with elaborate apparatus. The Heat Meter is particularly valuable in the factory and boiler house for the control of heat delivery in process water or heat recovery from return feed, etc. It can also be used in processing plant to form a basis for distribution of charges, and for assessing the heat per unit of output.

The instrument consists of a hot



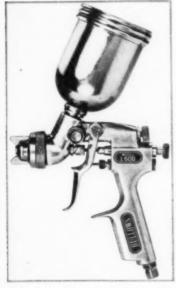
water meter, a counter directly measuring the B.Th.U's, calories, etc., consumed, two temperaturesensitive elements and a multiplying mechanism.

-(Enquiry Ref. No. J.51/9.)

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A NEW development in spray gun design is to be found in the Model 600, a top feed spray gun featuring an air pressure control device. With this, mottling can be done under accurate control with air at normal spraying pressure; fine control is available for delicate



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Three sizes of gravity cup are available, the ½ pint, ¾ pint and 1½ pint, and are made from spun copper having screwed lids. An assortment of nozzles can be obtained, depending on the material to be sprayed.

-(Enquiry Ref. No. J.51/3.)

JANUARY, 1951



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HOW STATISTICS HELP THE BUSINESSMAN

continued from page 52

operating records showing two factors that show simultaneous variations that are somehow connected. Mr. Philip Lyle, of Tate & Lyle Ltd., has quoted steam consumption and sugar output as an example of this. The greater the steam consumption, the higher is the output of sugar obtained. By plotting records of steam consumed and sugar output obtained over a considerable period, a series of points are obtained which fall roughly about a straight line.

Since other factors besides steam consumption affect output, the points will rarely fall actually on the line, but will lie within a band, the limits of which may be calculated statistically. Thus the manager can tell that, for any required output of sugar, steam consumption should not be less than one figure and not more than another; if the

actual figure obtained for any batch lies outside these limits, the chances are that something has gone wrong with the process and that a post mortem is required. This technique of regression analysis is applicable to a wide variety of data, including costing data, and Tate & Lyle Ltd. use it extensively in this application.

The comparatively simple techniques of analysis of variance, quality control charts and regression analysis can be applied by any student of Intermediate B.Sc. standard. The more advanced flights of statistics can, however, also yield valuable practical lessons for the industrialist.

British Insulated Callender's Cables Ltd. were faced with a situation common to many industries. Automatic machinery was in use, which broke down at irregular intervals and needed readjustment before it could be re-started. One man was in charge of a battery of such machines and was responsible for making the adjust-

ments necessary. It would occasionally happen that, while he was adjusting one machine, another would break down and have to remain idle while he completed adjustments to the first. The more machines he had to look after, the greater the risk that two or more of them would be idle through simultaneous breakdown of this type. On the other hand, the greater the number of machines looked after by one man, the lower the labour costs of the firm. Working from normal plant records, a statistician was able to deduce an equation which, by combining the risk of a breakdown in a given period with the relative cost of idle machine time and the labour costs for alternative loading of machines per worker, gave the optimum number of machines which a man could economically look after.

Thus the statistician at all levels can make a contribution to technical and managerial efficiency in any business organization.

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Forecast for 1951

continued from page 44

Employers should consider the possibilities of (a) up-grading existing male workers wherever possible, if necessary by short intensive training schemes; (b) replacing them by female workers; (c) recruiting blind and disabled workers; and (d) using part-time workers and outworkers.

"9. Part of the new load will fall on industries that would otherwise have been declining (e.g., shipbuilding), and part will involve the manning up of specialized capacity not fully utilized in normal conditions."

There is little evidence of any slackening off in recent months in any branch of engineering. Merchant shipping laid down during the first six months of 1950, before any arms orders had been given, amounted to 614,000 gross tons, a higher figure than any comparative period since 1946.

"10. But most of the demand will fall to be met in engineering by transfer of men, within firms or within the same section of the industry, from civilian to military production."

This is as may be. The fact remains that many far-sighted industrialists and trade union leaders foresee the large-scale transfer of men from other industries to engineering trades when production for rearmament expands.

The businessman who is not working for the armament programme or for export to dollar areas would be wise to prepare for a reduction in his working force. And employers in the engineering industries should look to their supervision, since they will be faced with an influx of green labour—boys, women, foreign workers, and all-but-unemployables.

"11. Before any order is placed involving the recruitment of 100 or more workers in areas where manpower is very short and of 500 or more in areas where the situation is easier, the Ministry of Labour will be consulted."

This is a normal precaution which would be taken by any large customer of industry.

MATERIALS

"12. Coal supplies should be sufficient for the additional factory demand, but it may be at the expense of exports if mining output fails to rise fast enough."

Stocks at the end of September were still below the safety margin of 16m. tons, and it is now admitted that imports from the U.S.A. will be necessary. The longer term position is governed by the increasingly acute manpower shortage, which threatens to prejudice completion of mine reorganization and re-equipment plans. The moral is: take whatever coal or coke is offered and stock it.

"13. Electricity shortage should not interfere with the programmed rise in output, subject to there being sufficient domestic economy at peak hours."

The power cuts of the past few months are sufficient evidence that domestic economy is not being sufficiently controlled. Production and capacity are both rising, but the installation of generators is still a wise precaution as an insurance aganst such cuts.

"14. Supplies of general types of finished steel are adequate to meet all needs and there should be enough sheet when the Margam hot-strip mill comes into operation next year (1951)".

According to the British Iron and Steel Federation, there should be an extra 750,000 tons of steel available in 1951 for home, export and rearmament use. The extra demands for rearmament are not expected to become serious before 1952. Sheet steel is a special case. Current output is insufficient, and since Margam will not become active until the late summer, the

position may well be serious for the major part of the year. The possibility of a cut in allocations of 25 per cent, for motor vehicle bodies (a high export priority) for the first quarter is being taken seriously.

Output of all grades of steel has been increasing faster than schedule. What will be wanted in future is a continuance of this, plus a high degree of flexibility as demand changes from one type of steel to another. So far the industry has shown this flexibility; whether it will do so under the Steel Board is a matter for speculation—and doubt.

"15. Cement supplies may give rise to some problems, and home and export claims will need careful consideration; the timber situation remains difficult."

The cement position remains tight, but excessive ordering seems to have abated. With record output this year and restricted exports, the industry should catch up with home demands.

The timber situation is probably the worst bottleneck of all, with both production and softwood imports steadily declining. More softwood could be got from Canada providing dollars were available.

"16. For other materials no special shortages are at present foreseen."

Within a month of the publication of this pious hope, Mr. George Strauss, Minister of Supply, was admitting that "our hopes are going to be falsified. One shortage is zinc; another is packaging materials, and there may be other shortages which will develop and which may be exceedingly tiresome,"

Zinc, copper, aluminium and tin, among non-ferrous metals, are likely to be short, but lead is satisfactory. Rubber, too, may become difficult to obtain. The supply of packaging materials of all types, including paper, board, fibre board, cellulose films, wax papers and tinplate containers is acute, and will not become easier. Delivery delays of nine and 12 months are common. Growing difficulties in the supplies of hides have made trading in

leather goods and boot and shoe industries difficult. In textiles, both raw wool and cotton supplies will be lower than in previous years, due to abnormally low crops in 1950; rearmament demands for these commodities, however, will not be heavy. Certain key chemicals will be scarce, but expansion of output in most grades will meet demand.

"17. No immediate additions to existing controls are contemplated; if circumstances made it necessary some of the controls lifted in recent months would be reimposed."

"18. Price controls will be maintained and, if necessary, extended."

Here, again, we are in the realms of speculation, since point 17 rested on the assumption that scarcities would be limited to coal, electricity, steel, timber and cement. Mr. Hugh Gaitskell, in his first speech as Chancellor of the Exchequer, suggested that requisitioning might be needed for shipping, cargo space, land and machine tools, but added:

"I do not know how extensive raw material controls will be."

"19. But some prices (of imports, for instance) are not within control and there cannot be complete rigidity in the field of wages and profits."

"20. To avoid a renewal of inflationary pressure, a continuance of voluntary restraint by all sections of the community is most necessary."

Inflation in this country has recently been largely of the imported type. The great rise in prices of imported raw materials, due partly to devaluation and partly to world market conditions, has been the main cause of rising prices in Britain. For some weeks, domestic factors have added to this pressure, and from now on this aspect will grow more important.

For the Government, the problem chiefly arises in framing the next Budget. For the wage and salary earners it is a matter of rising cost of living and fixed rates of pay. For industrialists it means using up stocks bought below present prices and selling finished products on the basis of cost rather than replacement. This brings in large nominal profits but uses up capital. Profits have been rising at an increasing rate for many months, but as stocks or plant have to be replaced, cash is drained away and a general shortage of working capital arises. That is already a widespread condition and will undoubtedly grow more acute.

In this situation, industry must be prepared to meet;

1. Further demands for increased vages. These will obviously be less urgent if an incentive scheme is in force.

2. Rising prices of rate materials,

3. Increased pressure in favour of exports, particularly since the suspension of Marshall Aid.

 A shortage of working capital. Expenditure that can be postponed should be deserved in order to keep finances as liquid as possible.

5. Increased taxation—possibly a return of E.P.T. and (less probably) a further capital levy.



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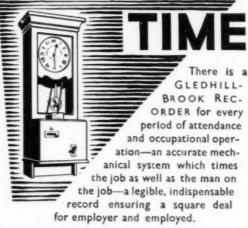
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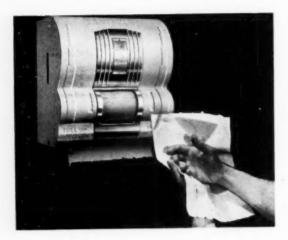


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Nursery in a Textile Works

By DAVID MICHAEL

By setting up a works nursery, fully equipped and staffed, a Lancashire textile firm have found a practical solution to the problem of the married woman who is eager to take a job in industry, but anxious about her children.

LITTLE more than a century ago the words "children in the textile works" would have suggested a pale, overworked, underpaid bunch of youngsters—youngsters who earned the sympathy of men like Dickens and who worked long hours in dark, drab, uncomfortable surroundings. But to-day at Shiloh Mills, Royton, Lancashire, where the relations between employees and employers are marked by loyalty and understanding, it's a case of "children in the nursery,"

More than 50 per cent, of Shiloh's employees are women, many of them married, and in 1941, in order to encourage those with families to continue working, the company built a nursery to take care of the children. Since then daily enrolment has grown to include about 60 children ranging in age from six months to five years.

Collected each morning in gailydecorated vans which sometimes leave as early as 6.30 a.m., the children spend the greater part of the day at the nursery, and are returned between 5 and 6 p.m. Each mother is charged 5s, per week, the remainder of the cost (estimated at 24s, per head) being borne by the company,

Under the expert care of the matron and her staff, the children lead a planned life. According to age, their routine varies between periods of play, rest and exercise in the park. The nursery kitchen caters for breakfasts and teas, but the main midday meal is cooked by the regular canteen staff.

Besides being an ideal play environment, the nursery also encourages the children to learn good personal habits by providing miniature wash basins and toilets. Two people are kept fully employed in a laundry, part of the nursery itself, which provides clean bed clothes, linen and other items.

An international flavour—if this is possible in a nursery—has been noticed among the children. The labour shortage, which has hit

many of the spinning mills during the past few years, has led to increased employment of foreign workers, who also send their children to the nursery.

Shiloh Mills started as a cooperative enterprise in 1874. Since then it has grown from a mill with 26,460 spindles to one which will contain, after reorganizing, 205,000 spindles. There are approximately 600 employees.

Welfare amenities are by no means restricted to the nursery service, for Shiloh as a whole is an impressive example of the new spirit in the textile industry. Work rooms are clean, light and attractively painted. Whenever work permits, operatives may rest on specially provided seats and, at the end of the day, can enjoy a shower bath in the well-equipped cloakrooms. At one mill a current scheme of re-equipment will provide—in addition to new machinery—a canteen and welfare block.

Works surgeries, which often mean the difference between a slight cut and a bad infection, are

Photo shows one of the special vans which take children to the nursery.

open for an hour in the morning and afternoon. The doctor visits one day per week, employees attending for routine examinations, special consultations, sun-ray or infra-red treatment, chiropody, etc.

A good meal in the canteen—including soup, meat, vegetables, sweet and tea or coffee—costs 1s, 4d. All food is freshly prepared and cooked in the spacious canteen kitchen, and about 260 people are served with their midday meal in ten minutes.

For a subscription of 2d, per week an employee can belong to the sports club, which has facilities for cricket, tennis, bowls, football, netball, table tennis, darts and so on. Every encouragement is also given to employees to take up educational activities.

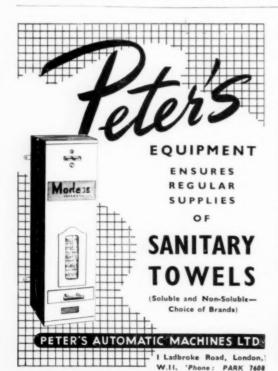
In 1941, the year the nursery opened, a Works Council was formed, consisting of 12 members appointed from the managerial side, and 17 freely elected by employees.

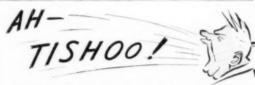
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piece work rate which ensures fair shares and a substantial wage packet, have not solved the everpresent labour shortage which has hit Shiloh and all other spinning mills. The employment of foreign workers has helped to ease the situation to some extent, and their children, from the plains of Poland and the mountains of Italy, are being brought up in the mill nursery alongside the sturdy young representatives of the East Lancashire valleys.





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Solving the Problem of Rising Canteen Costs

By F. G. MURRAY

Director of Catering to the Ministry of Supply

The prices paid for nearly every commodity used in canteens have risen in the past few years, and the movement is as yet unchecked. How should management tackle this problem? By raising canteen subsidies—or the charge to the customers?

PACED with rising costs and reduced takings, industrial caterers are going through a difficult period. The trading accounts of a representative cross-section of 450 canteens show a reduction in turnover of 121 per cent, without a corresponding decrease on the expenses side. The lack of spending power among canteen customers has been most marked over the past 12 months; many, it is obvious, have been bringing their own snacks from home, only having canteen meals on certain days. This money "tightness" is confirmed in the difficulty a canteen manager now has in disposing of his full allocation of cigarettes.

Examination of an average canteen trading account for 1949 shows that out of every £100 of takings, £50 was spent on food and £40 on wages, leaving £10 for overheads. The margin was small, but nevertheless the canteen just managed to break even, Now, however, the trading account shows that the £100 has shrunk to £88. On the other side of the ledger, wages remain about the same, but food prices have increased by 5 per cent, with the result that little or nothing remains for overheads. The simple solution would be to increase prices, but on a falling turnover this might not give the desired result.

Analysis of the costings of several canteens shows that the principal factor of loss has been the high cost of the main course. In some cases only 20 per cent. of the workers took a main meal; in other cases the figure was as high as 80 per cent. This variation has not been due to indifferent meals or service, but to the fact that in certain areas the custom has always been for workpeople to have sandwiches, and custom dies hard.

There is no doubt that the can-



F. G. Murray, as Director of Catering to the Ministry of Supply, administers 357 canteens, including 80 in Royal Ordnance Factories, 85 in the Ministry's outstations, 144 for the Admiralty and 33 in Ministry of Labour Training Centres. These canteens have a total seating capacity of 96,692. Over a period of eight weeks they provide 191,892 breakfasts, 2,264,380 main meals, 6,934,966 light meals and 13,953,080 hot beverages. Murray's 15 area catering managers report to headquarters daily by telephone, meet for conferences several times yearly.

teen manager of to-day must study his customers more than ever in order to maintain his revenue. The snack meal has a considerable sale in certain canteens; it is, of course, a more profitable side of the business, needing less labour to prepare and showing a higher gross percentage. The tea meal is another good source of revenue, particularly when sandwiches, cakes and so on can be sold.

On the profit and loss side, many employers are well aware of the present difficulties in making ends meet and are content to increase the subsidies to their canteens. Other employers, feeling that the canteen should stand on its own feet, may consider it necessary to raise prices. Many firms have found that it has not been possible to hold the 1949 prices which were more or less standard throughout the country. This is the problem that is causing most concern to industrial caterers.

Further to increase subsidies in these days of rapidly increasing prices could be a cause of some embarrassment, especially to many of the smaller organizations. Having already provided buildings and equipment, and allowed free light, heat, water and maintenance, it would appear only fair and reasonable to expect the canteen to carry the remainder of its costs. To add to the employer's subsidies a further item such as canteen staff wages would be asking rather too much.

What, then, is the alternative? It seems that increased prices to cus-

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tomers must be the answer, but the customers, with their reduced spending powers, may not be able to meet these increases, with the result that canteens, instead of serving the purpose for which they were originally intended (i.e., providing a hot mid-day meal) will deterioriate into snack bars serving tea, cakes, sandwiches and snacks. Consequently much of the costly equipment installed, and the space given to kitchens, will cease to serve any useful purpose.

These factors will have to be given most careful consideration before any final decision is made.

Aid to Efficiency

Most employers will agree, from experience, that a good canteen can do much to increase general efficiency; and there is no question that well-fed employees not only do a better day's work but are also less likely to be absent through sick-

Many canteens, especially those directly operated, suffer from indifferent management. It is not enough for managers to produce reasonably good food; they must be competent both in catering and organization.

The qualifications essential to successful canteen management include a thorough knowledge of the kitchen; ability to plan good menus; ability to show and, if need be, teach the cooks how to make the most of food stuffs; and a constant determination to avoid any form of waste.

Also important is the selection of staff. Trained canteen personnel are not easily obtained, and management must therefore be capable of imparting the necessary knowledge and guidance to inexperienced newcomers. If an outside caterer is employed, he will, of course, be responsible for engaging a qualified manager and staff. Several large catering firms are prepared to carry out investigations and to submit comprehensive reports on the full operation of a directly managed canteen. This

service is widely used by industry and is particularly recommended when losses are heavy and assurance is sought that these are not due to wasteful or indifferent management.

At the beginning of 1949 a canteen manager's charges were probably as follows: Soup, 2d; meat and veg., 11d.; sweet, 3d.; tea, 1½d. There is no doubt that an increase on that tariff would be well justified. The prices paid for nearly every commodity used in canteens have risen steadily over the past few years, and the movement is as yet unchecked.

A final word on trading accounts. These must be prepared at regular intervals, and the more often the better. In many cases, if a canteen is losing money, once a week is not too often, but certainly accounts should be produced at least every month.

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